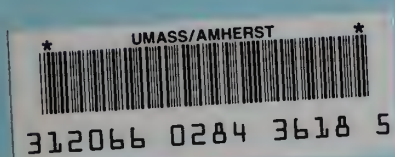


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June 1989



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South Shore Septage Management Study

*This project was funded through a Strategic Planning Grant
awarded by the Executive Office of Communities and Development*



Metropolitan Area
Planning Council
60 Temple Place
Boston, MA 02111

903 / 378

South Shore Septage Management Study

May 8, 1989

June 30, 1989

METROPOLITAN AREA PLANNING COUNCIL
BOSTON, MASSACHUSETTS

This project was funded through a Strategic Planning Grant awarded by the Massachusetts' Executive Office of Communities and Development.



ABOUT THIS REPORT

This report was prepared by the staff of the Metropolitan Area Planning Council in cooperation with the South Shore Coalition. The Metropolitan Area Planning Council is the officially designated regional planning agency for 101 cities and towns in the Boston metropolitan area. The Council offers technical assistance to its member communities in the areas of land use, housing, environmental quality, energy, transportation, and economic development.

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Chapter 1

BACKGROUND AND SUMMARY

This report was prepared by the staff of the Metropolitan Area Planning Council in cooperation with the South Shore Coalition. In 1986, the South Shore Coalition formed the South Shore Water Supply Protection Committee to enable the communities to coordinate planning and management of their water resources. First on the committee's agenda was the protection of the area's drinking water. In October 1986, Metropolitan Area Planning Council secured a water quality planning grant from the Department of Environmental Quality Engineering to assist the committee in preparing a regional water supply protection plan. This study was completed in September of 1988. The next issue on the committee's agenda was to address the issues surrounding septage management. In October of 1988 MAPC secured strategic planning grant from the Massachusetts' Executive Office of Communities and Development to assist the committee in preparing a septage management study. The purpose of the study is to evaluate the current practices and alternative methods for the treatment and ultimate disposal of septage within a framework of local and regional alternatives. This report presents the analysis, findings, and recommendations of the study.

The overall methodology of the study included the following steps:

- o inventory of current septage collection and disposal practices within the communities through survey data from local Boards of Health, treatment plants, and septage haulers;
- o estimation of present and future of septage volume generation and available disposal capacities;
- o evaluation of pertinent environmental regulations including Title 5 and a review of community management program options available for septic system maintenance;
- o identification of alternative septage disposal options including the financial requirements;

- o formulation of an action plan for collection and disposal choices.

All the findings and recommendations have been reviewed by the South Shore Water Supply Protection Committee, which has met throughout the course of the study and has provided valuable information and guidance.

The range of the study includes the ten-town South Shore Coalition: Cohasset, Duxbury, Hanover, Hingham, Hull, Marshfield, Norwell, Rockland, Scituate and Weymouth (see Figure 1-1).

Metropolitan Area Planning Council

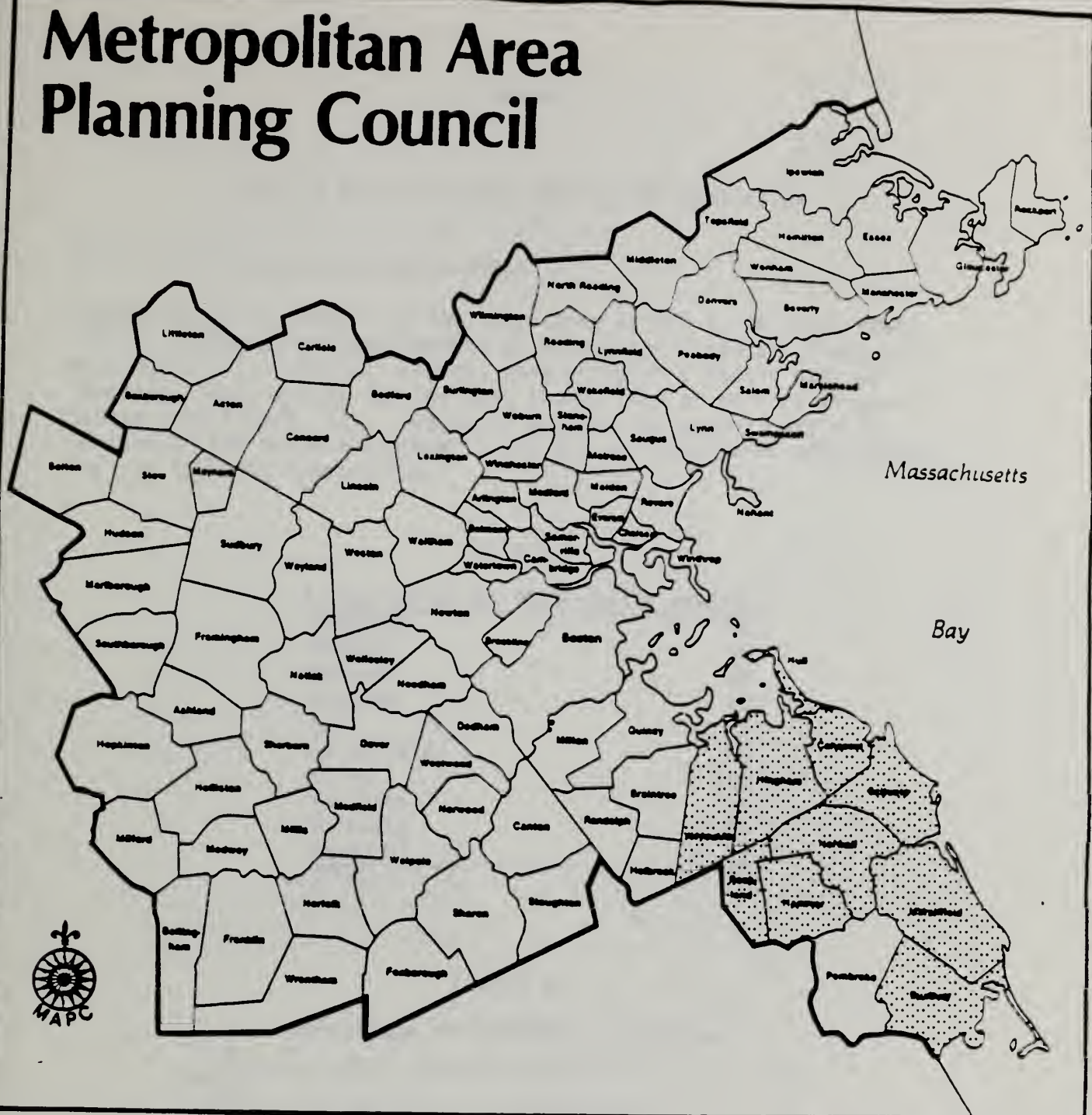
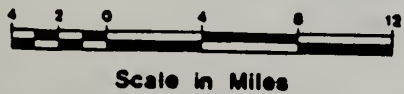


Figure 1-1

Regional Location Map



Scale in Miles

Atterbury's Lake
County, Ohio



Map of
Atterbury's Lake

Chapter 2

ON-SITE SEPTIC SYSTEMS AND SEPTAGE GENERATION

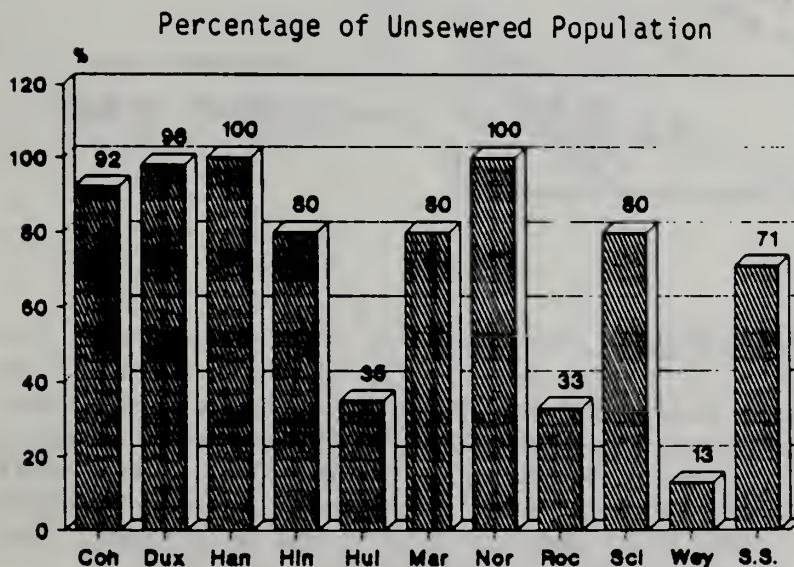
SEPTIC SYSTEM USE ON THE SOUTH SHORE

Approximately 70 percent of the population of the South Shore study area is served by on-site methods of wastewater disposal (Table 2-1 and Figure 2-1). Septic systems, consisting of a septic tank and leaching field, are by far the most common form of on-site disposal system (see Figure 2-2). Cesspools account for approximately 37 percent of the on-site systems in use and are considered unacceptable for new building construction.

Table 2-1

% Population Not Municipally Sewered	
Cohasset	92
Duxbury	98
Hanover	100
Hingham	80
Hull	35
Marshfield	80
Norwell	100
Rockland	33
Scituate	80
Weymouth	13
TOTAL	71

Figure 2-1

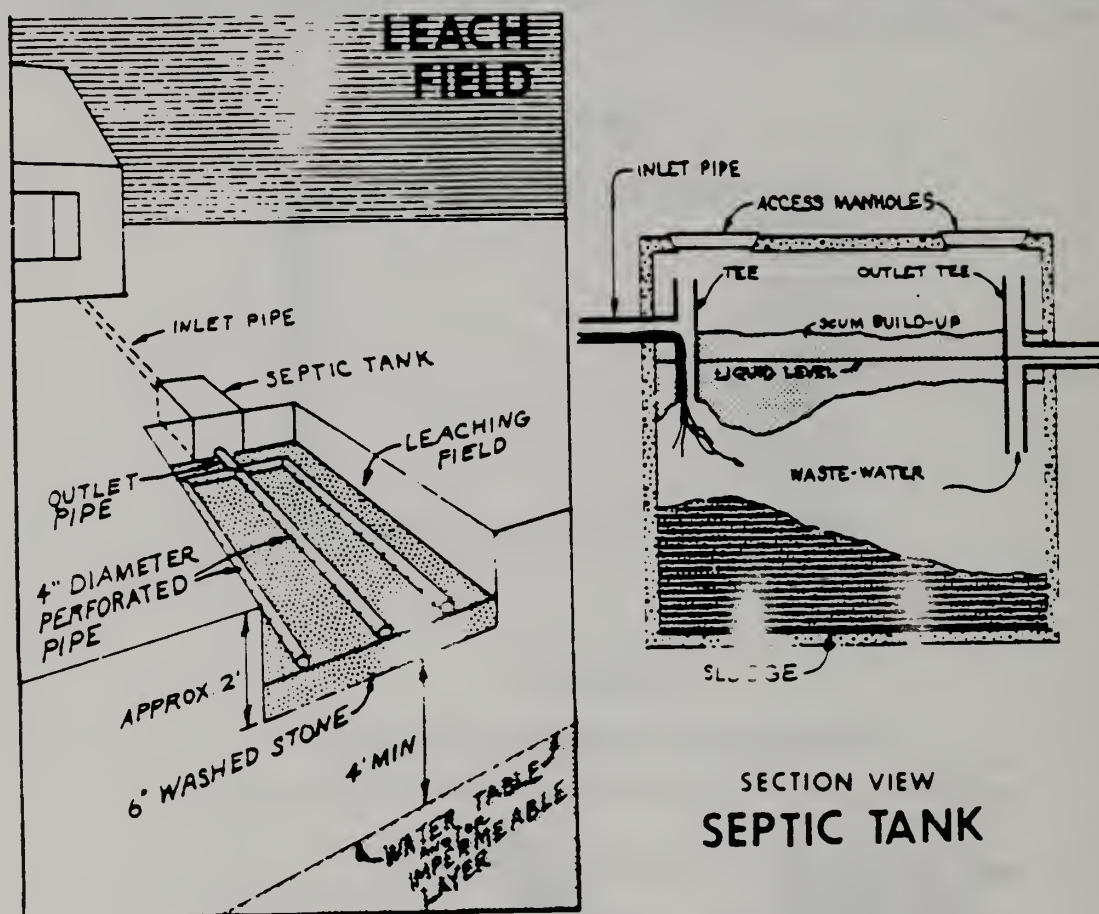


SEPTIC SYSTEMS

The most common septic system is made up of two components; a septic tank and a leaching area (see Figure 2-2). This system functions by allowing wastewaters to flow from their source (usually a house) into a septic tank, where settling and initial bacterial purification occur. From the septic tank, portions of the wastewater flow into a leaching area, where final purification of the liquid portion of the waste is accomplished by ground absorption.

Figure 2-2

Schematic drawing of a Septic System and Leach Field



CHARACTERISTICS OF SEPTAGE

Septage is a material which must be periodically removed from the septic tank. Septage may foam and generally has a highly offensive odor. Settling properties are highly variable. Some samples settle readily to about 20-50% of their original volume, whereas others show little settling. Significant amounts of grit may be present. Large concentrations of total coliform, fecal coliform and fecal

streptococci have been found in septage. Table 2-2 illustrates the physical and chemical characteristics of septage.

Table 2-2
Physical and Chemical Characteristics of Septage

Parameter	Minimum	Maximum	EPA suggested Design Value
Total solids, TS	1,132	130,475	40,000
Total volatile solids, TVS	353	71,402	25,000
Total suspended solids, TSS	310	93,378	15,000
Volatile suspended solids, VSS	95	51,500	10,000
5-day biochemical oxygen demand, BOD5	440	78,600	7,000
Chemical oxygen demand, COD	1,500	703,000	45,000
Total kjeldah nitrogen, TKN	66	1,060	700
Ammonia nitrogen NH3 - N	3	116	150
Total Phosphorus, P	20	760	250
Alkalinity	522	4,190	1,000
Grease	208	23,368	8,000
pH	1.5	12.6	6.0
Aluminum, Al	2.0	200	50
Cadmium, Cd	0.03	10.8	0.7
Chromium, Cr	0.6	2.2	1.0
Copper, Cu	0.3	34	8
Iron, Fe	3.0	750	200
Mercury, Hg	0.0002	4	0.25
Nickel, Ni	0.02	37	1.0
Lead, Pb	2.0	8.4	10
Zinc, Zn	2.9	153	50

Values expressed as mg/l, except for pH
Source: U.S. EPA, 1980.

The estimated number of private on-site septic systems now in operation on the South Shore is 35,238 (see Table 2-3). This number was arrived at by taking the 1988 unsewered population (numbers provided by local Boards of Health, see Appendix A) and dividing that by U.S. Census Bureau estimates of household size (persons/household).

Table 2-3

1988 Number of Private On-Site Septic Systems

Town	1988 Unsewered Population	Persons\ Household	Unsewered Households
Cohasset	6,800	2.9	2,345
Duxbury	11,570	3.0	3,857
Hanover	11,800	3.4	3,471
Hingham	16,800	3.0	5,600
Hull	3,852	2.9	1,328
Marshfield	18,400	2.9	6,345
Norwell	10,000	3.3	3,030
Rockland	5,000	3.0	1,667
Scituate	12,600	2.9	4,345
Weymouth	9,100	2.8	3,250
Total	105,922		35,238

For a septic systems to operate properly, maintenance is essential. Maintenance means the cleaning or pumping out of a septic system on a regular basis.

SUBSURFACE DISPOSAL REGULATIONS

The Massachusetts Environmental Code (310 CMR 15.00) Title 5: Minimum requirements for subsurface disposal of sanitary sewage states that a septic tank should be inspected and cleaned at least annually. In addition, Title 5 states that every owner of an individual disposal system shall keep it in proper operational condition and shall have such works cleaned or repaired at such time as ordered by the Board of Health. These Massachusetts regulations are not strictly enforced by local Boards of Health in most communities.

SEPTAGE QUANTITY GENERATION ESTIMATES

Estimates of septage quantity vary greatly depending on the existing reporting and monitoring procedures of septage flows, or assumptions about the number of on-site systems and the frequency of septic tank pumping. Septage generation projections in this study are based on residential use only. Reliable data to account for commercial or industrial septage is not available. The projections which we arrived at in this study were taken from the equation:

Septage (gallons/year) =

$$\frac{\text{Population} \times \% \text{ unsewered Pop.}}{\text{Household size}} \times \frac{\text{Tank Volume}}{\text{Years Between Pumping}}$$

The average tank volume was considered to be 1500 gallons. In addition, the publication Current Population Reports 1987, U.S. Bureau of Census, growth in the number of household 1986-2000, estimates a 5% decrease in household size between the years 1980 and 1986 (approximately 1% per year). This 5% decrease per year is used to calculate septage generation from 1990-2010.

Septage quantities are projected for annual pumpings and for a pumping frequency of every three years. These two quantities are projected for five scenarios, 1988, 1995, 2000, 2005, and 2010 (Tables 2-4, 2-5, 2-6, 2-7 & 2-8).

Table 2-4
1988 Septage Generation (gallons)

Town	# Unsewered Households	Septage Volumes -- Pumped	
		Annually	Every 3 Yrs
Cohasset	2,345	3,517,500	1,172,500
Duxbury	3,857	5,785,500	1,928,500
Hanover	3,471	5,206,500	1,735,500
Hingham	5,600	8,400,000	2,800,000
Hull	1,328	1,992,000	664,000
Marshfield	6,345	9,517,500	3,172,500
Norwell	3,030	4,545,000	1,515,000
Rockland	1,667	2,500,500	833,500
Scituate	4,345	6,517,500	2,172,500
Weymouth	3,250	4,875,000	1,625,000
Total	35,238	52,857,000	17,619,000

Table 2-5
1995 Septage Generation (gallons)

Town	# Unsewered Households	Septage Volumes -- Pumped	
		Annually	Every 3 Yrs
Cohasset	2,497	3,745,500	1,248,500
Duxbury	4,795	7,192,500	2,397,500
Hanover	4,063	6,094,500	2,031,500
Hingham	6,758	10,137,000	3,379,000
Hull	1,704	2,556,000	852,000
Marshfield	7,347	11,020,500	3,673,500
Norwell	3,419	5,128,500	1,709,500
Rockland	1,850	2,775,000	925,000
Scituate	4,769	7,153,500	2,384,500
Weymouth	3,720	5,580,000	1,860,000
Total	40,922	61,383,000	20,461,000

Table 2-6
2000 Septage Generation (gallons)

Town	# Unsewered Households	Septage Volumes Annually	-- Pumped Every 3 Yrs
Cohasset	2,697	4,045,500	1,348,500
Duxbury	5,239	7,858,500	2,619,500
Hanover	4,400	6,600,000	2,200,000
Hingham	7,343	11,014,500	3,671,500
Hull	1,840	2,760,000	920,000
Marshfield	8,034	12,051,000	4,017,000
Norwell	3,714	5,571,000	1,857,000
Rockland	1,993	2,989,500	996,500
Scituate	5,150	7,725,000	2,575,000
Weymouth	3,869	5,803,500	1,934,500
Total	44,279	66,418,500	22,139,500

Table 2-7
2005 Septage Generation (gallons)

Town	# Unsewered Households	Septage Volumes Annually	-- Pumped Every 3 Yrs
Cohasset	2,809	4,213,500	1,404,500
Duxbury	5,527	8,290,500	2,763,500
Hanover	4,714	7,071,000	2,357,000
Hingham	7,660	11,490,000	3,830,000
Hull	1,916	2,874,000	958,000
Marshfield	8,421	12,631,500	4,210,500
Norwell	4,048	6,072,000	2,024,000
Rockland	2,072	3,108,000	1,036,000
Scituate	5,366	8,049,000	2,683,000
Weymouth	4,206	6,309,000	2,103,000
Total	46,739	70,108,500	23,369,500

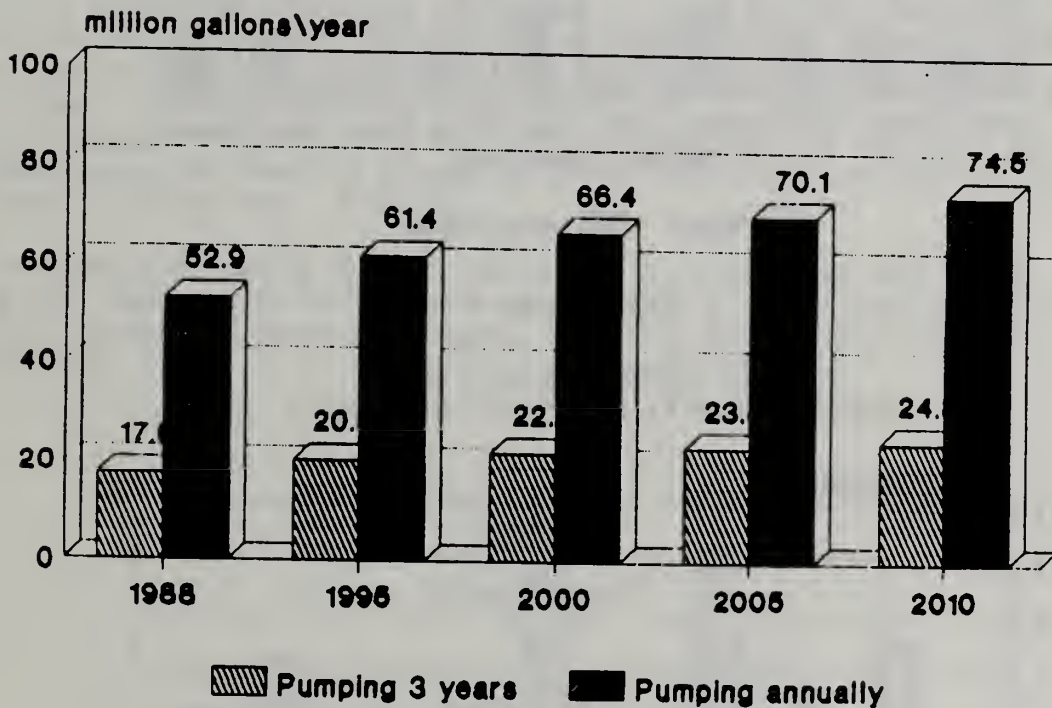
Table 2-8
2010 Septage Generation (gallons)

Town	# Unsewered Households	Septage Volumes Annually	-- Pumped Every 3 Yrs
Cohasset	2,931	4,396,500	1,465,500
Duxbury	6,093	9,139,500	3,046,500
Hanover	4,888	7,332,500	2,444,000
Hingham	8,352	12,528,000	4,176,000
Hull	2,000	3,000,000	1,000,000
Marshfield	8,805	13,207,500	4,402,500
Norwell	4,321	6,481,500	2,160,500
Rockland	2,253	3,379,500	1,126,500
Scituate	5,598	8,397,000	2,799,000
Weymouth	4,397	6,595,500	2,198,500
Total	49,638	74,457,000	24,819,000

The projections show that if systems are pumped annually, the region's septage generation would increase from 52.8 million gallons per year (mgy) in 1988 to 74.4 mgy in the year 2010, a 41 percent increase over 22 years. Under a scenario of pumping every three years on average, septage generation would increase from 17.6 mgy to 24.8 mgy (see Figure 2-3).

Figure 2-3

Projected Septage Generation - South Shore Coalition



Figures 2-4 and 2-5 further illustrate the increased septage generation from 1988 to 2010 for each community.

Figure 2-4

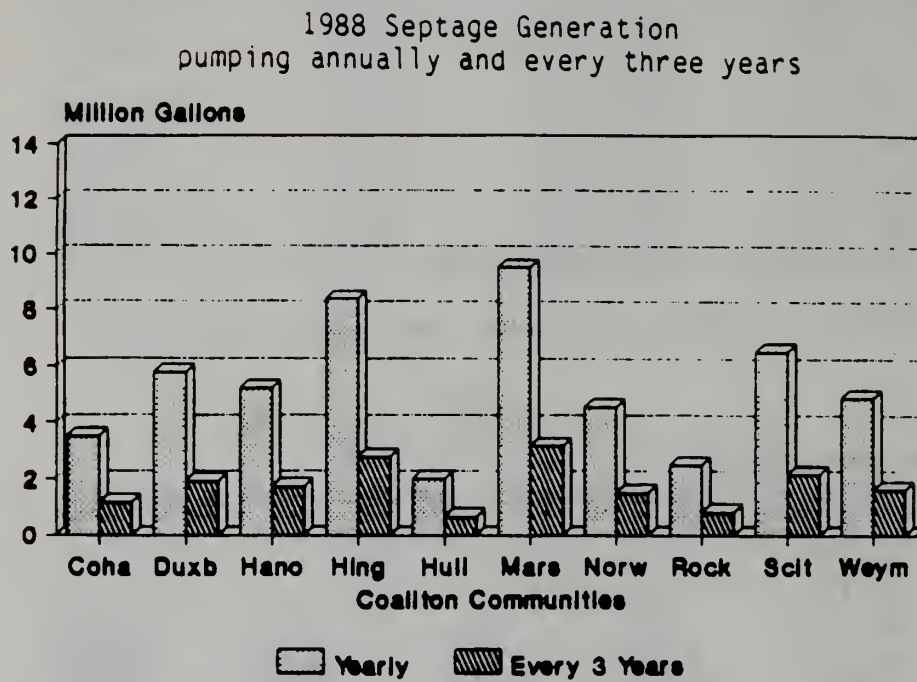
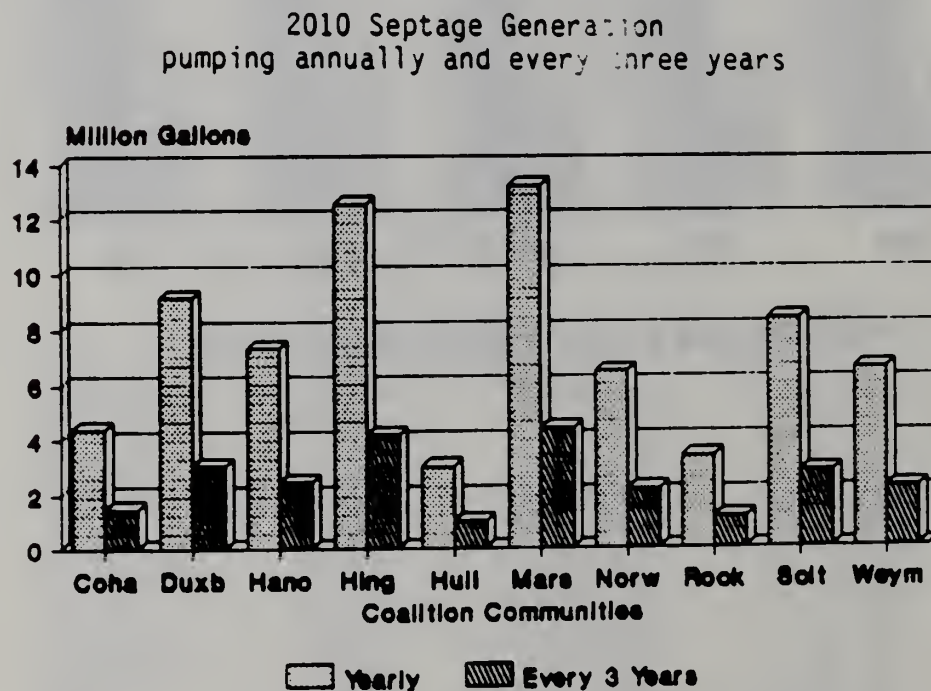


Figure 2-5



PRIVATE SEWAGE TREATMENT FACILITIES

There are concerns as to whether the use of private sewage treatment facilities (PSTF's) will substantially increase the rate of septage generation within a community. Although a Generic Environmental Impact Report (GEIR) is underway regarding what effect these facilities will have on communities, it is estimated that they will not produce more septage per person than an on-site septic system. The major question then will be whether or not these facilities will increase the carrying capacity within an individual community. From a build-out study done by MAPC for the town of Hopkinton, MA it was estimated that the use of private sewage treatment facilities would accomodate about 10 percent more housing units than septic systems alone. This estimate is relevant to Hopkinton under current regulations on PSTF's. More in-depth data will be gathered during the GEIR study for PSTF's.

GREASE TRAPS

Title 5 of the Massachusetts Environmental Code also has requirements for the containment and disposal of restaurant grease. Grease traps must be provided for restaurants, nursing homes, schools, hospitals and other installations with large quantities of grease expected to be discharged. Grease traps must be inspected monthly and shall be cleaned when the level of grease is 25% of the effective depth of the trap or at least every 3 months.

From a Board of Health survey (see Appendix A) we found that there are 455 traps on the South Shore and the only disposal facility which accepts grease is Upper Blackstone, servicing Hanover and Cohasset (see Table 2-9).

Table 2-9

Grease Traps

Town	# of traps	capacity (gallons)
Cohasset	15	2,500
Hanover	20	1,000
Hingham	80	1,000
Hull	20	
Norwell	20	
Weymouth	300	
Total	455	4,500



Chapter 3

SEPTAGE COLLECTION

PRIVATE SEPTAGE HAULERS

Private septage haulers collect septage from individual septic tanks using septage pumping and hauling trucks with a capacity ranging from about 1000 to 7500 gallons. Some homeowners have their systems pumped on a regular basis, but most request pumping when there is an emergency, when the system has backed up, or there is surface pooling, etc. Homeowners are charged between \$100 - \$200 for this service. Haulers must be licensed with local Boards of Health to pump and haul in that community (Title 5, section 15.02 and 15.19). Permits require that pumping equipment is properly maintained, that the contents of septic systems are transported in a manner that does not create a nuisance and that disposal is done at a DEQE approved site. Licenses generally cost from \$50 to \$100 a year. Some towns require yearly truck inspections while others require one inspection when the hauler initially applies for the license. Application forms often require the hauler to list disposal locations.

There are twenty-two haulers licensed in the study area (see Table 3-1).

Table 3-1
South Shore Septage Haulers

<u>Company, Owner, and Address</u>	<u>Licensed in these towns</u>
AAA Atlas Pumping Nicholas McKinnon 31 East Water Street, Rockland	Cohasset, Hull, Norwell, Marshfield, Weymouth
A-Able Pumping Service Gerry Condon 75 Norman Street, Rockland	Hanover, Norwell, Marshfield, Weymouth
A-1 Sanitation & Pumping Serv. John Devine 32 Carver Street, Halifax	Duxbury, Hanover, Hingham, Marshfield, Norwell, Weymouth
A.E.W. Pumping Co. Lawrence M. Henrich Jr. PO Box 354, Halifax	Norwell, Marshfield

<u>Company, Owner, and Address</u>	<u>Licensed in these towns</u>
All-Town, Inc. James Rorke 43 Lane Street, Marshfield	Cohasset, Hull, Norwell, Marshfield, Scituate, Weymouth
Alfred and Olan Sewage Disp. Co. 209 Gardner Street, Hingham	Cohasset, Hingham, Hull, Norwell, Scituate, Weymouth
K.R. Anderson Pumping Co. Kenneth Anderson 141 Lincoln, Norwell	Hingham, Norwell Marshfield, Scituate
Farrar Pumping & Constr. Co. 160 Arnold Street, Abington	Weymouth
Expressway Sewerage Co., Inc. Vernazzaro Bros. 6 Smith's Lane, Kingston	Duxbury, Marshfield
E.L. Margetts & Sons, Inc. 97 Ward Street, Hingham	Cohasset, Hingham, Hull, Norwell, Weymouth, Scituate
Marshfield Sanitary Pumping The Wilson Group 420 Washington Street Braintree	Marshfield, Rockland Scituate
Dana A Nash Pumping Service Dana A. Nash 74 Washington Street, Abington	Hanover, Hingham, Hull, Norwell, Rockland, Scituate Weymouth
John Papasodero 19 G Street, Hull	Hingham, Hull
R. Roderiques & Sons 29 Hatherly Road, Scituate	Cohasset, Scituate
Rooter Man, Livingston Constr. D.R. Livingston dba Rooterman PO Box 20, Cohasset	Cohasset, Hingham, Hull Duxbury, Norwell Scituate, Weymouth
Paul Davis\Ross Rosano 325 No. Main Street, Cohasset	Cohasset, Hull, Norwell, Scituate
Scott-Foley Pumping Co. Box 905, Marshfield	Marshfield
Earl F. Simmons Co., Inc. 206 Silver Street, Hanover	Hanover, Hingham, Hull, Norwell

<u>Company, Owner, and Address</u>	<u>Licensed in these towns</u>
South Shore Pumping Inc., Kenneth Leary 789 Mayflower Street, Duxbury	Hanover, Norwell Marshfield, Rockland, Scituate
Peter F. Spencer, Jr., Inc. 1 Union Street, Scituate	Cohasset, Hull, Norwell, Marshfield, Scituate
C. Spirito, Inc. Michael Spirito 43 Fresh River Avenue, Hingham	Cohasset, Hanover, Hingham, Hull, Norwell, Rockland Scituate, Weymouth
Jim Kelly Vita-Bac Co. Vel-Ban Inc. 80 Mountain Avenue, Pembroke	Hanover, Marshfield

Nineteen out of the twenty-two haulers serving the region responded to a survey administered by the DEQE and followed up by MAPC (see Appendix B). From this data we were able to put together a chart tabulating the number of trucks used by each hauler, the number of trips to disposal sites and the yearly volumes being pumped (Table 3-2). To keep the information confidential haulers names have been removed from the data. The data shown is a representation of the situation in the general area, as many of these haulers also serve towns outside the study area.

Table 3-2

Hauler Truck Capacities, Trips to Disposal Sites and Yearly Volumes (with estimated trips\ day averages)					
Hauler	# trucks	capacity (gallons)	# trips	trips\day truck	yearly volume pumped (gals)
1	1	3,500	30\mo.	1.4	200,000
2	2	5,000			3,000,000
		3,000			
3	1	3,000			150,000
4	2	5,000	2\day		2,600,000
		5,000			
5	1	3,500			500,000
6	2	2,500	?	1.7	3,315,000**
		5,000			
7	2	2,500	6\day	3	5,070,000*
		4,000			
8	2	2,000	?		1,500,000
		2,500			
9	4	1,500	?	1.7	4,862,000**
		2,000			
		2,500			
		5,000			
10	1	2,000	1\week		100,000
11	1	1,500	30\mo	1.4	450,000
12	1	2,500	7\day	7(?)	22,000(?)
13	3	1,000	2-5\day	1-1.7	5,000,000
		3,200			
		4,000			
14	1	2,000	10\week	2	2,000,000
15	3	2,500	4-5\day	1.3-1.7	12,000,000
		2,500			
		7,500			
16	3	3,500			5,000,000
		2,500			
		2,500			
17	1	1,500	25-30\mo	1.2-1.4	500,000*
18	4	2,000			4,000,000
		2,500	4-6\day		
		3,000	3-4\week		
		6,000	1\day		
19	3	2,150			
		2,150			
		2,150			

* estimate based on truck capacity and number of trips reported by hauler

** estimate based on truck capacity and estimated average number of trips (based on average of 7 haulers)

Table 3-3 summarizes the yearly pumping volumes for the haulers serving the greater South Shore area.

Table 3-3
Yearly Volumes Pumped by Haulers

1.	200,000
2.	3,000,000
3.	150,000
4.	2,600,000
5.	400,000
6.	3,315,000**
7.	5,070,000*
8.	1,500,000
9.	4,862,000**
10.	100,000
11.	450,000
12.	22,000?
13.	5,000,000
14.	2,000,000
15.	12,000,000
16.	5,000,000
17.	500,000*
18.	4,000,000
19.	confidential
TOTAL	50,169,000

* estimate based on truck capacity and number of trips reported by hauler

** estimate based on truck capacity and estimated average number of trips (based on average of 7 haulers)

There are generally two transportation alternatives for the haulers to take, direct haul to a disposal facility or transport to an intermediate tank truck which can take two or more pumper truck loads to the disposal site. Transfer to a larger truck is used when the disposal facility is a long distance from the point of collection.

The lack of available disposal capacities on the South Shore is placing a financial burden on the area's septage haulers. Costs of hauling septage excessive distances to authorized disposal facilities must be offset by increasing customer service fees. The prices charged by haulers who dispose of septage legally are not competitive with those charged by haulers who dump illegally.

Table 3-4 is a matrix outlining which disposal locations are used by the haulers serving the South Shore study area towns.

Numbers in the matrix refer to the hauler codes used in Tables 3-2 and 3-3. The last column (?) refers to haulers for whom the survey data shows no apparent disposal facility available for septage collected within a community in which the hauler is licensed.

Table 3-4
Hauler Disposal Locations

	Blackstone	Hull TP	Leary Lagoons	Marsh TP	MURA	Ridders Lagoons	Rockland TP	Scituate TP	Simmons Lagoons	?
Cohasset										7 17 11 13
Duxbury			16			2 6 8				
Hanover	7					1 2 5 9 10			15	13 3
Hingham					5 7	1 5 9 15 18			15	
Hull		1 7 9 10 11 13 15 17 18								
Marshfield				1 2 3 5 8 12 13 14 17		2 1 5				
Norvell						1 2 5 9 15 18				3 7 11 12 13 17
Rockland						2 9 10	1 9 15			
Scituate						2 9 5		5 7 8 11 12 13 17		
Weymouth					1 5 7 13 18					

Although Title 5, the regulation requiring annual pumping of septic systems, is not enforced alternative methods have been instituted. The town of Hingham has a Board of Health regulation which requires a septic system inspection with the transfer of real estate with structures using a septic disposal system. The inspection must be done before the sale closing. The inspection is performed by a septage hauler or septic system installer licensed by the Hingham Board of Health. The inspection data is then filed with the Board of Health and a copy is given to the buyer. The data include a drawing of the location of septic system cover or covers.

Similarly, the Chatham Board of Health has a Real Estate Transfer regulation (see Appendix C). Chatham requires that the inspection be performed by a registered Engineer or Sanitarian. A Certificate of Compliance and Inspection Form is then filed with the Board of Health with copies given to the seller, buyer, and Assessor's Office of Chatham.



Chapter 4

EXISTING METHODS OF SEPTAGE DISPOSAL

One of the major problems identified in this study is the issue of the present and future methods used to dispose of the septage in an environmentally sound and cost-effective manner.

The magnitude of the problem increased in late 1976 when the Metropolitan District Commission reminded eleven communities currently disposing septage into the Metropolitan Sewer District facilities that they must be prepared to handle their own septage after December 1, 1979 at which time the MDC would no longer accept septage from non-member communities.

In addition, the State Department of Environmental Quality Engineering has been forcing a cut back on the use of lagoons for treating septage. Some towns within the study area have relied on this type of treatment (see Appendix D).

The current disposal practices in the study area range from community to community. Some of the methods include co-treatment with wastewater treatment plant, lagoons, and disposal outside the community at a distant facility. Several communities have no designated disposal facility.

SOUTH SHORE COALITION - COMMUNITY BY COMMUNITY ASSESSMENT OF SEPTAGE DISPOSAL PRACTICES

Cohasset. Cohasset does not currently have a facility within its boundaries capable of treating septage. Cohasset has recently entered into an Intermunicipal Sewer Agreement with the Town of Hull's Water Pollution Control Facility for a daily acceptance of 6,000 gallons of septage. This agreement has not been implemented because the state funding necessary to construct the connecting sewer line is unavailable at this time. It is expected that the Sewer Agreement will not go into effect until approximately 1991. The Hull Water Pollution Control Facility is interested in resuming the practice of accepting septage from outside communities, including Cohasset. In the past Cohasset was able to dispose 2,000 gallons per day of septage into the Hull WPC Facility. This arrangement was discontinued due to technical complications at the treatment plant. At this time the technical problems have been solved. But, other complications have arisen. Problems have developed regarding the disposal of sludge, the end product of the septage treatment process. Because of this sludge problem the Hull WPC Facility has not been able to resume the practice of taking in septage from outside communities. However, as an interim solution Cohasset has a contract with Upper Blackstone Pollution Abatement District in Millbury, MA for septage disposal. The facility is about 60 miles

from Cohasset. To date, only sludge from the Cohasset Wastewater Treatment Plant has been disposed of at Blackstone. With an addition to the town bylaw, private on-site system septage disposal will be included. The present contract with Upper Blackstone terminates June 30, 1989. The current procedure at Blackstone is to continue all existing contracts. Blackstone does however view agreements with towns that are a great distance from Millbury as interim.

Duxbury. The town of Duxbury does not currently have an assigned septage disposal site. There is a privately-owned septage treatment operation located in Duxbury. The facility consists of an open pit lagoons with sand beds. These lagoons have a daily capacity of 10,000 gallons. Currently this facility is in the permit process for upgrading. The proposed upgrade consists of an aerobic digestion system, a Rotating Biological Contactor. The system will be able to accommodate 50,000 gallons of septage per day. The facility is designed to accept septage from outside communities. However, there has been significant opposition to the proposed facility by Duxbury residents.

Hanover. The town of Hanover has within its bounds a private lagoon operation, which accepts 4,000 gallons of septage daily. The town of Hanover also has a Septage Agreement with the Upper Blackstone Water Pollution Abatement District. This agreement is for an unlimited daily volume. The agreement expires June 30, 1990. Upper Blackstone has been in the practice of renewing contracts with only those towns that have previously been signed on with the District. Therefore, Hanover can expect to be allowed to continue the practice of disposing an unlimited amount of septage in Millbury, Massachusetts. However, because of the great distance between the two communities (60 miles) this solution is viewed as temporary.

Hingham. A small number of unsewered properties in the northern section of Hingham, the North Sewer District, are served by the Massachusetts Water Resources Authority "night soil" facility which conveys the septage to the MWRA Nut Island treatment plant in Quincy. It is estimated that 13,500 gpd of septage from Hingham enters the MWRA system. Currently, the Hingham septage facility is not monitored and controlled adequately by the MWRA. In a 1983 study done by SEA Consultants, Inc. it was recommended that this facility among many others put closer restraints on the intake (origin, quantity and quality) of septage. Septage generated outside this District is restricted from using the facility. Outside the North Sewer District the town of Hingham does not currently have a designated septage disposal site. There are no other septage handling facilities located in Hingham. Septage generated in Hingham outside that North District may be disposed of at Ridders Farm septage lagoons located in East Bridgewater. Ridders has a maximum daily capacity of 24,000 gallons, with an average daily intake of 18,000 gallons per day. Likewise, several other communities

contribute to the daily intake of septage at Ridders Farm. In the past the Hull Water Pollution Control Facility accepted 2,000 gpd of septage from Hingham. Due to technical problems it was stopped. This practice is expected to resume in the coming months once the sludge disposal problem is alleviated.

Hull. The town of Hull is almost entirely sewered by the municipality. The septage generated in the small percentage of town not sewered is co-treated at Hull's Water Pollution Control Facility. Several months ago the Hull facility discontinued the practice of accepting septage from outside communities. The facility was experiencing technical difficulties with the processing of solids. These problems have been solved but the facility is confronting another issue, sludge disposal. The disposal of the end product, sludge has to be ameliorated before the facility can resume accepting septage. In the past the municipal landfill in the town of Hull took sludge from the plant. The landfill is nearing capacity and the municipality is concerned with maintaining the longevity of the site. By discontinuing the practice of receiving sludge at the landfill, Hull hopes to add several years to the life span of the site. Consequently, the WPC Facility is in the process of searching for sludge disposal sites including a place in Buffalo, New York. There is a possibility that the Hull Facility will soon return to the business septage handling.

Marshfield. Currently Marshfield has septage lagoons located at the town landfill. These lagoons accept 40,000 gallons of septage daily. Marshfield is presently under a DEQE Administrative Order to close the lagoons and have an alternative facility in use by December of 1990. The future plans are to co-treat the septage at the Marshfield Wastewater Treatment Facility. The facility will accept 15,000 gallons of septage on an average day and up to 40,000 gallons per day at peak times. The facility is not considering accepting septage from outside Marshfield at this time.

Norwell. The Town of Norwell does not have a facility within its border accommodating septage disposal. Moreover, Norwell does not have a septage facility site assignment at this time. Currently, two private facilities, Ridders Disposal Facility located in East Bridgewater and Simmons located in Hanover, are the only viable management options for septage generated in Norwell. Both facilities are septage lagoons. Ridder's lagoons have a daily capacity of 24,000 gallons and an average daily intake of 18,000 gallons. Ridders is presently in the planning stage of a system upgrade. Simmons' septage lagoon operation accepts a daily volume of 4,000 gallons. In addition, both disposal operations accept septage from many communities other than Norwell. The Hull WPC Facility will possibly resume receiving 2,000 gpd of septage from Norwell in the future.

Rockland. Rockland serves its septage disposal needs by co-treatment. The Rockland Wastewater Treatment Plant currently receives 1,850 gallons of septage daily. Rockland's plant does not accept septage from outside communities.

Scituate. Scituate's North River Water Pollution Control Plant is presently co-treating septage at a daily rate of 11,000 gallons. The facility does not accept septage from outside Scituate.

Weymouth. The Massachusetts Water Resource Authority (MWRA) accepts all septage generated in the Town of Weymouth. Weymouth septage is co-treated at the MWRA Treatment Facility located on Nut Island in Quincy. It is estimated that 31,000 gpd of septage enters the MWRA system from Weymouth.

DISPOSAL SITE CAPACITIES, SEPTAGE GENERATION AND THE REGIONAL PATTERN OF SEPTAGE TRANSPORTATION

The facilities on which the study area towns rely and their current and future capacities are outlined in Table 4-1. Figure 4-1 illustrates disposal methods by community. Figure 4-2 shows the location of the septage facilities within the Coalition region and Figure 4-3 shows the regional patterns of septage transportation to the disposal facilities.

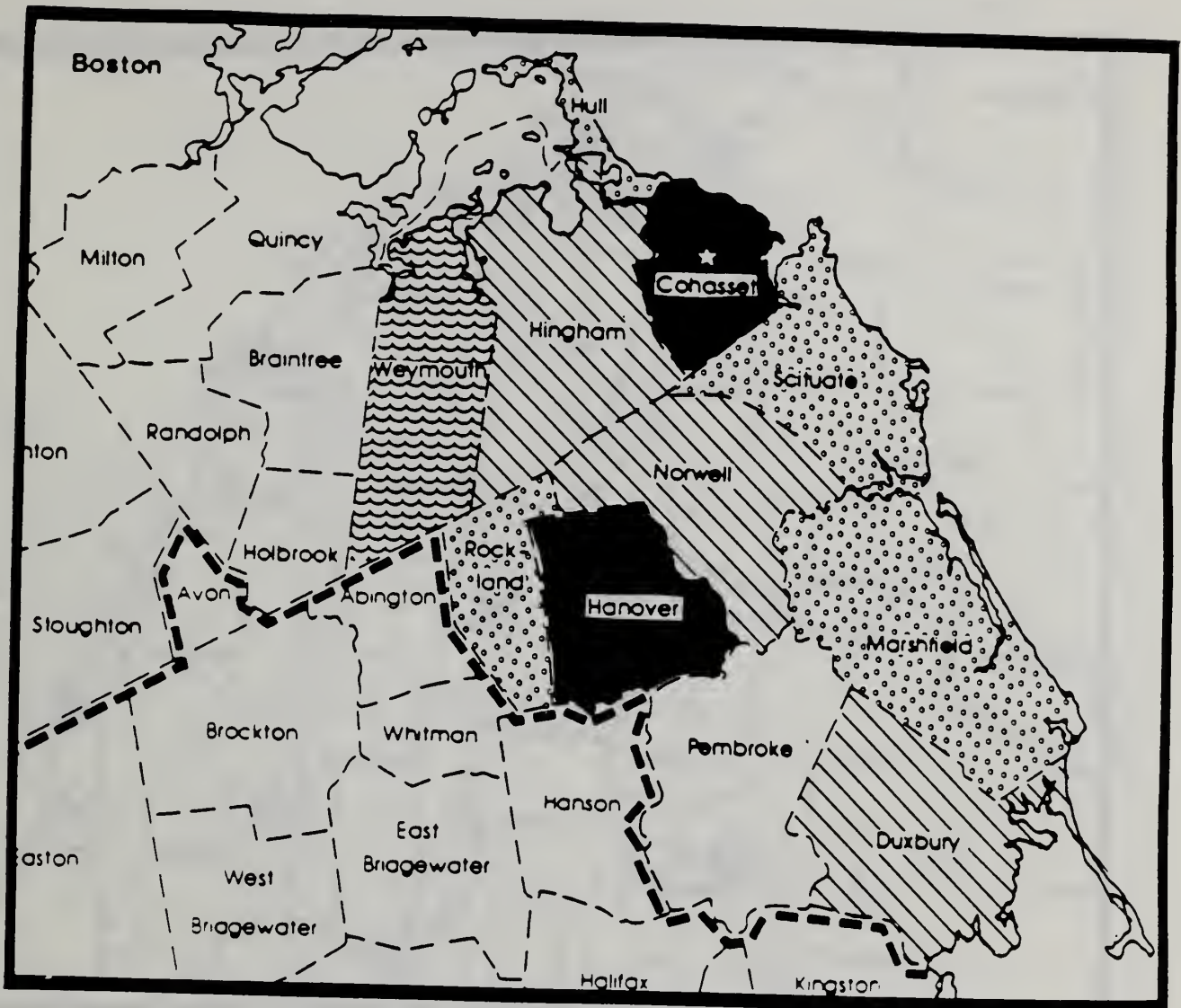
Table 4-1

Current South Shore Disposal Capacities (gpd)

Facility	Max. Capacity	Current Flow	Future Capacity
Blackstone		80,000	
Hull TP	20-25,000	2,000	6,000 agrmnt w\ Coha
Leary, Duxbury (lagoons)	10,000	10,000	50,000 TP
Marshfield (lagoons)	40,000	?	40,000 TP
MWRA (Hingham/ Weymouth)	---	43,000	
Ridders (lagoons)	?	24,000	50,000 TP
Rockland TP	8-10,000	1,850	
Scituate TP	7,000	11,000	
Simmons, Han.		4,000	
Total		175,850 gallons per day	
		45,500,000 gallons per year	

In Table 4-2 the current septage disposal capacities are compared with the estimated septage generation if septic systems were maintained in an environmentally sound manner and pumped annually and every three years. It can be seen that if septic systems were pumped on an annual basis several South Shore towns would be below capacity.

Figure 4-1



Septage Disposal Methods






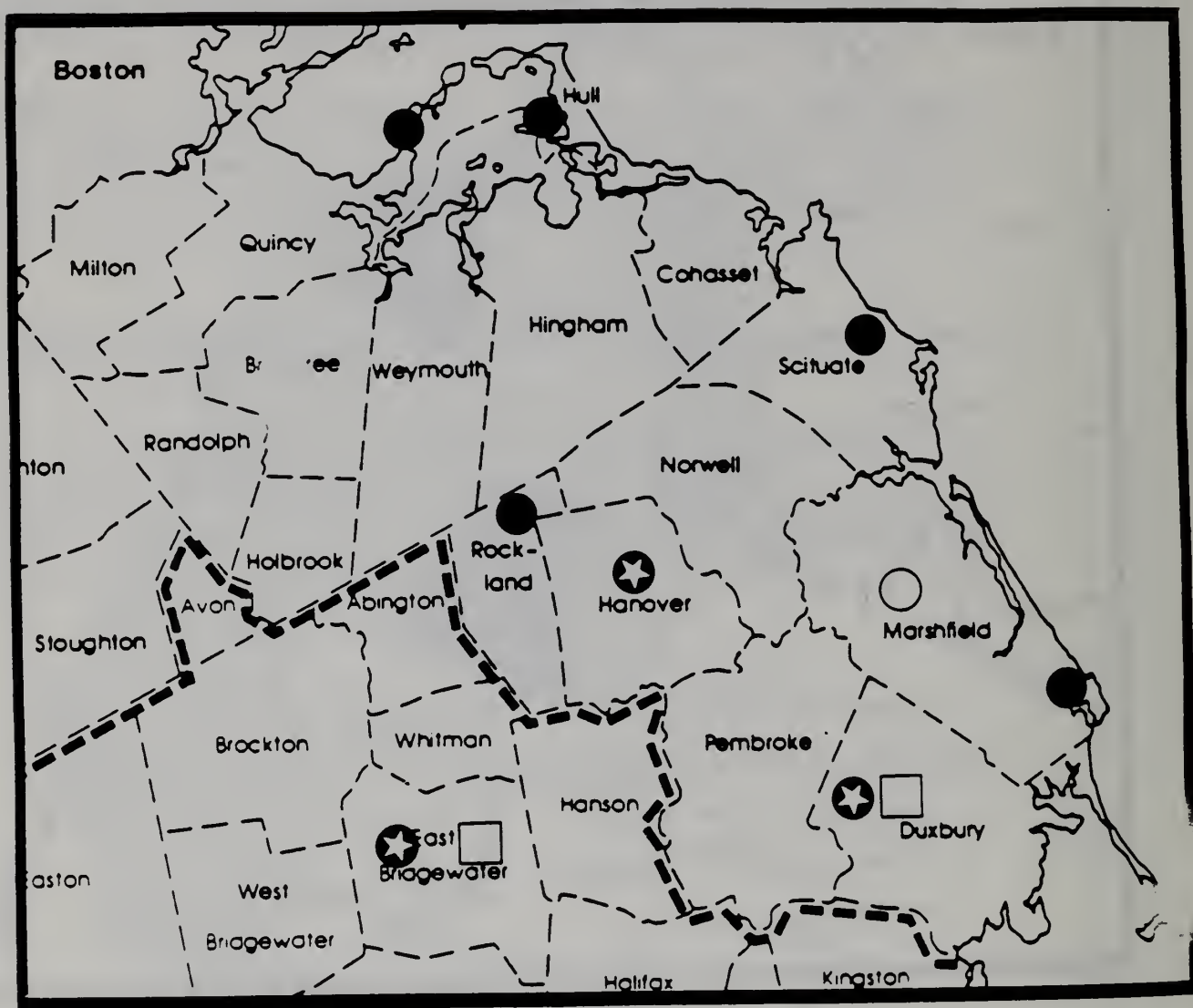
-  Municipal WWTP
-  MWRA
-  Contract-Blackstone
-  Future Intermunicipal Agreement (with Hull)
-  No Designated Facility

Figure 4-2



Septage Facilities

- Municipal WWTP
- Municipal Lagoons
- ★ Private Lagoons
- Proposed STP (Private)

Septage Treatment Facilities and Flows

Legend:

- Municipal:** Star (★)
- Regional:** Circle (●)
- Private:** Square (■)
- Transfer:** Dotted line with arrow (.....➔)

Existing Facilities (Stars): Boston, Weymouth, Norwell, Marshfield, Duxbury, Wrentham, Taunton, Attleboro, Framingham, Needham, Weymouth, Norwell, Marshfield, Duxbury, Wrentham, Taunton, Attleboro, Framingham, Needham.

Proposed Facilities (Squares): Wrentham, Taunton, Attleboro, Framingham, Needham.

Regional Facilities (Circles): Wrentham, Taunton, Attleboro, Framingham, Needham.

Private Facilities (Squares): Wrentham, Taunton, Attleboro, Framingham, Needham.

Transfer Flows (Dotted lines with arrows): Numerous dotted lines with arrows indicate the flow of septage from various towns to treatment facilities, including flows from Boston, Weymouth, Norwell, Marshfield, Duxbury, Wrentham, Taunton, Attleboro, Framingham, Needham, and many other towns.

Table 4-2

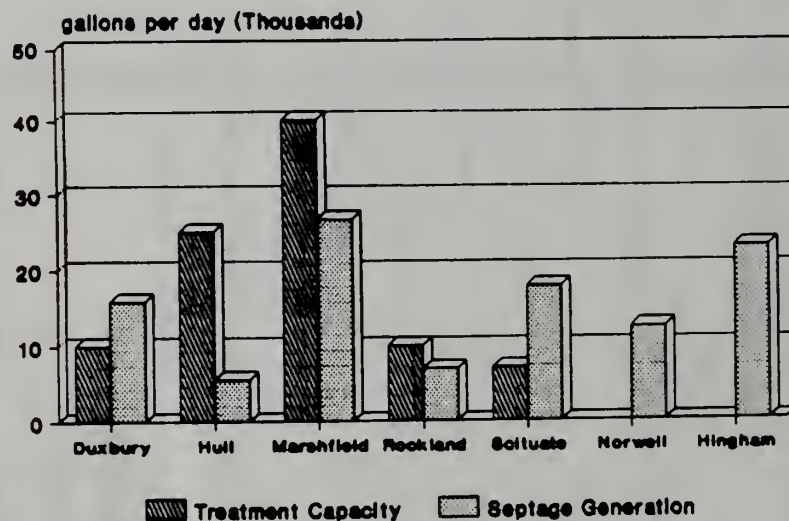
Disposal Capacities and Estimated Septage Volumes (gpd)

Town	Estimated Treatment Capacity	1-Year Current Generation	3-Year Maximum 1988	Maximum 1988
Cohasset --	no limit		9,637	3,212
Up. Blackstone				
Duxbury	10,000	10,000	15,851	5,284
Hanover --				
Up. Blackstone	no limit			
Simmons	4,000	4,000	14,264	4,755
Hingham	0		23,014	7,671
Hull	25,000	2,000	5,457	1,819
Marshfield	40,000		26,705	8,692
Norwell	0		12,452	4,151
Rockland	10,000	1,850	6,851	2,281
Scituate	7,000	11,000	17,856	5,952
MWRA - Hingham & Weymouth	no limit		13,356	4,452
Ridders 20+ towns	24,000			

Figure 4-4 further illustrates septage generation and available capacities.

Figure 4-4

Treatment Capacity vs. Projected Septage Generation



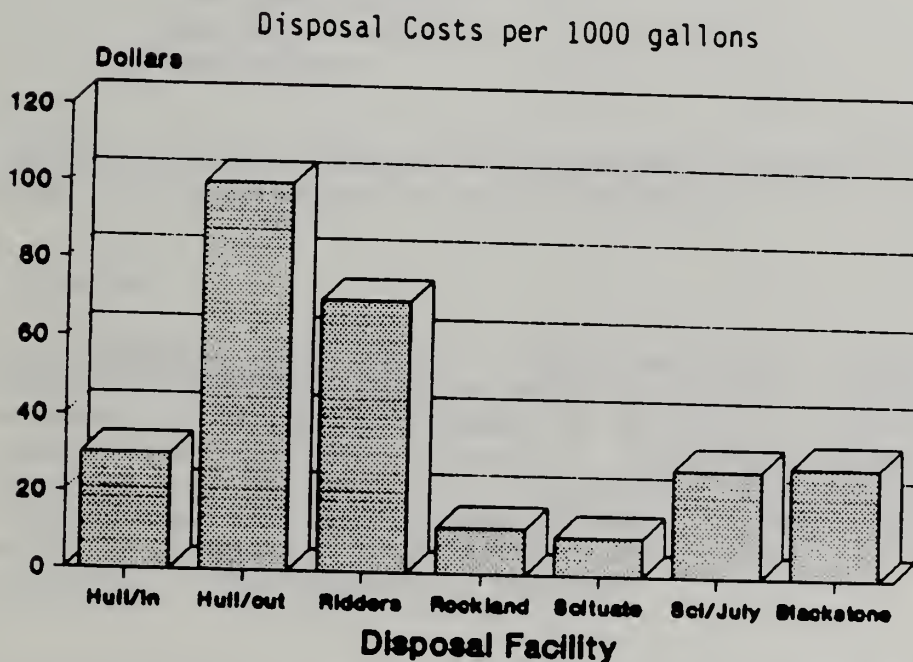
COSTS

Disposal costs range from facility to facility (see Table 4-3 and Figure 4-5). Disposal costs have risen and will continue to rise. The co-treatment facility in the town of Scituate is raising its prices for accepting septage from \$10/1000 gallons to \$28/1000 gallons disposed in July of 1989. In addition, the Hull Wastewater Treatment plant intends to raise the disposal fee when it resumes accepting septage sometime this season.

Table 4-3
Disposal Costs

Facility	Cost Per 1000 gallons
Hull (in-town)	\$30
Hull (out-of-town)	\$100
Ridders	\$70
Rockland	\$12
Scituate	\$10
Scituate (beginning July, 1989)	\$28
Upper Blackstone	\$29

Figure 4-5



Rising disposal and transportation costs are reflected in higher pumping fees for the homeowner. Haulers report that the average residential pumping fee has risen from about \$50 to \$150 in the past few years.



Chapter 5

ALTERNATIVE SEPTAGE TREATMENT AND DISPOSAL METHODS

The purpose of this chapter is to identify and describe the major septage treatment and disposal methods and to provide an assessment of the costs of these technologies.

Septage treatment and disposal alternatives described in this report are:

- Land Spreading
- Trench/lagoon/landfill-burial
- Land application

- Co-treatment
- Co-treatment

- Independent Treatment
- Stabilizing Lagoon
- Composting
- Aerobic Digestion
- Anaerobic Digestion
- Lime Stabilization
- Chlorine Oxidation
- Aquaculture

Each of these disposal alternative is described below and the advantages and disadvantages of each is outlined.

LAND SPREADING

1. Trench/Lagoon/Landfill-burial. After dewatering, solids are placed in a landfill. Site evaluation is crucial. Landfill acceptance of septage is dependent on the ratio of refuse and septage to maintain moisture control. Advantages include low operation costs and simplicity of operation. Disadvantages include insect breeding, foaming problems, foul odors and potential groundwater contamination. These methods are being phased out in Massachusetts by the DEQE.
2. Land application. Land application of liquid or dewatered septage can be accomplished through either surface or subsurface methods. Surface application is accomplished by spreading septage directly onto plowed soil or on grassy areas. Generally, the spreading is done by tank truck. Other methods include spray irrigation and ridge and furrow. Surface spreading is frequently

used in remote areas where likelihood of human contact is minimal.

There are three subsurface application techniques, 1) plow-furrow cover method, septage is applied in a narrow furrow 6-8 inches below the surface and covered with earth; 2) injection method, septage is injected in either a wide band or several narrow bands into cavities 6-8 inches deep; and 3) Terrator method, a machine with an oscillating chisel point opens a hole and dispenses the septage to a depth of 20 inches.

Subsurface land application techniques have the advantages of better odor and pest control and also reduces the chances of human or other contact with pathogenic organisms. Disadvantages include the need for a holding facility during periods of frozen or saturated soil and the increase of nitrogen and heavy metals and likelihood of groundwater contamination.

CO-TREATMENT

3. Co-treatment. Co-treatment is a method whereby septage is accepted at a wastewater treatment plant. Although septage is similar to sewage, it is highly concentrated and stronger than sewage. Due to the high solids and oxygen demand loadings of septage, pretreatment facilities are often required. Pretreatment facilities can include holding tanks or lime stabilization. There are three ways which septage can enter the treatment facility: a) addition to liquid stream, b) addition to sludge stream, and c) addition to both streams.

Advantages of co-treatment include maximizing use of existing experienced personnel available to operate facilities and equipment. Disadvantages include: pretreatment requirements; land and power required for pretreatment; potential for plant upset; increased load could result in plant not meeting discharge permit effluent criteria; increased solids handling required; and the lack of tested design criteria.

INDEPENDENT TREATMENT

These are facilities which are constructed exclusively for septage handling.

4. Stabilizing Lagoon. This management practice is slowly being phased out by the Massachusetts State Department of Environmental Quality Engineering. However several do remain in operation.

The lagoon system is a simple technology. Lagoons require large amounts of land and are simply a pit in the ground of ranging depths. There are generally three types of lagoons, anaerobic (relatively deep), aerobic (less than 2 feet deep), and facultative (which are basically the former two in combination).

Advantages include low operation costs and simplicity of operation. Disadvantages include sludge removal requirements, foul odors, and the potential for groundwater contamination.

5. Composting. Composting of septage is a process in which the organic material is stabilized by biological decomposition in an aerobic environment. Septage which has been properly composted is a relatively inert, nuisance free, humus-like material. There are three commonly used composting methods: windrow, aerated pile, and within-vessel. In the Aerated Pile Method (see Figure 5-1), partially dewatered sewage sludge or septage (5-35% solids), is mixed with a bulking material such as woodchips and constructed into a pile which contains a loop of perforated pipe in its base to facilitate forced aeration. The pile is covered with a blanket of unscreened compost, which insulates the pile and filters odors arising from the pile. Air is drawn through the pile periodically with a blower and the exhaust air is conducted through an odor filter pile comprised of screened compost. Within 3 days after composting begins pile temperatures have risen to a range of 60 to 70 degrees centigrade where they remain for most of the 21 day composting period. At the end of this period the pile is taken down and the composted biomass is removed and transferred to an unaerated curing pile for 3 to 4 weeks. During this process compost undergoes further drying. Uses for compost include agricultural and landscape purposes.

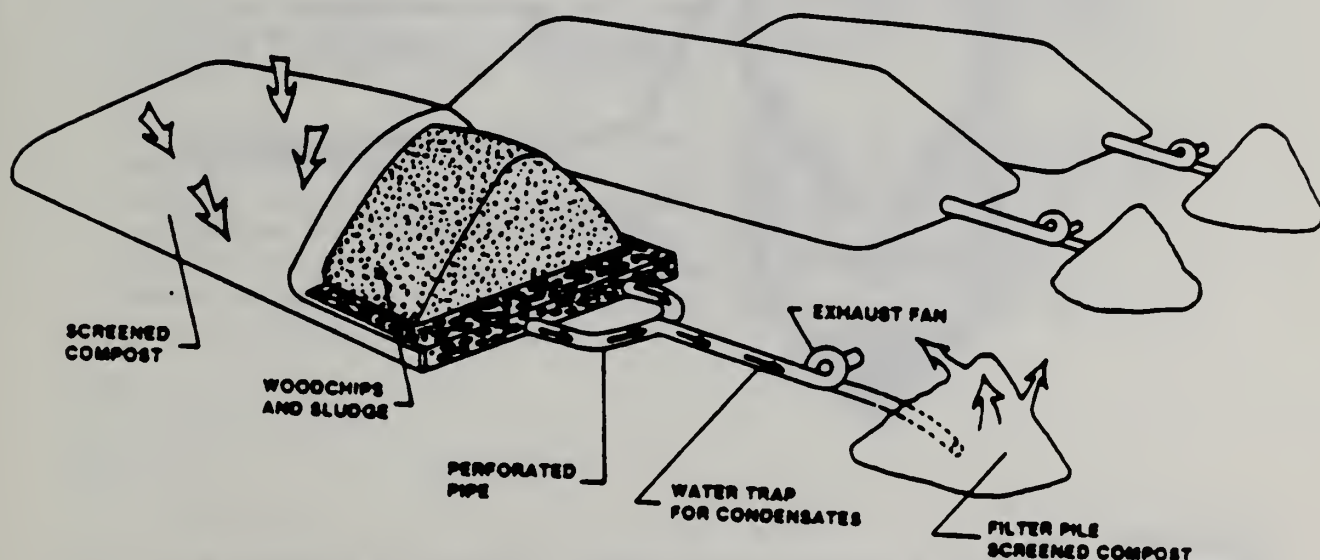


Figure 5-1
Three dimensional schematic diagram of the Aerated Pile Method for composting septage.

Advantages of composting include low cost, good pathogen kill, and a potentially reusable product. Disadvantages include the bulking agent (availability and cost), mixing, possibly need for dewatering, leachate and runoff collection system and possible power requirements for mixing and/or aeration and dependency on market demand for end product.

6. Aerobic Digestion. Aerobic digestion is the process of aerating septage in a reactor until it is stable and inoffensive. The systems usually consist of three chambers: pre-settling, aeration and final settling or leach field. The Rotating Biological Contactor (RBC) is a commonly used aerobic system. This system utilizes a fixed culture of microorganisms mechanically rotated through the wastewater to remove both dissolved and suspended matter. It offers a high degree of treatment in a relative short detention time. The settled solids are stabilized, thickened and vacuum filtered before disposal at a sanitary landfill.

Advantages of using an RBC include simplicity of operation and maintenance and ability to handle high organic loads efficiently. Disadvantages include the need for additional settling and sludge handling facilities, subject to upset due to shock loads and toxic substances and high operational costs.

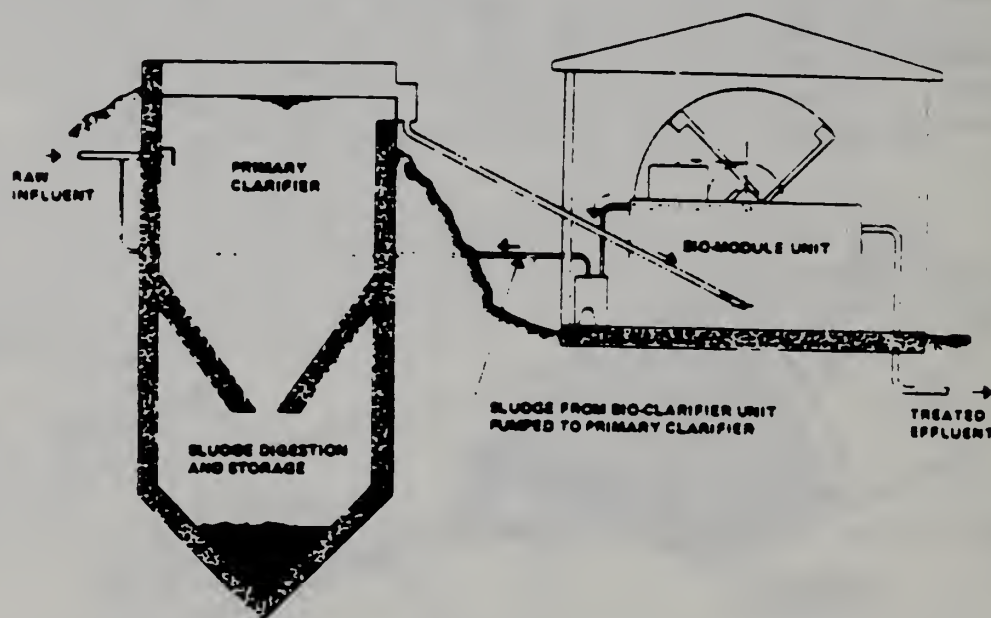


Figure 5-2
Schematic drawing of a pre-settling chamber followed by a Rotating Biological Contactor.

7. Anaerobic Digestion. Anaerobic digestion of dewatered septage is a commonly used process that offers reductions in both volatile organic matter and pathogens at moderate operating costs, producing a well stabilized sludge. A typical system consists of a tank in which the contents are heated and mixed. Within the tank biological organisms break down material in the sludge in an environment devoid of oxygen. The sludge can then be land applied or landfilled.

8. Lime Stabilization. Lime stabilization is a chemical treatment process in which a lime slurry is added to septage in a holding tank to raise the pH to approximately 12 and maintained for 2 hours. Septage is then thickened in a dewatering process. This can be done mechanically (vacuum filter, filter press) or by sand drying beds, to 20 to 30% solids. The sludge can then be land applied or landfilled.

Advantages to this method includes excellent bacterial removal due to the high pH, almost all organic compounds and toxic metals are complexed in the sludge at a of pH 11.5 and costs are competitive with other alternatives. Disadvantages are primarily associated with the unknowns of the process, including long term effects of sludge in landfills, the effects of liquid effluent on groundwater quality, and the chemical costs.

9. Chlorine Oxidation. The Purifax chlorine oxidation treatment process passes raw septage through a coarse bar screen and grit removal unit to an equalization/holding tank. From there it is pumped through grinders at a controlled rate to the chlorine oxidation units. In these units, elevated pressures and high chlorine dosages stabilize and deodorize the septage. Prior to disposal the septage is dewatered using lagoons. The sludge can then be land applied or landfilled.

Advantages of this treatment system includes the production of a biologically stable, odorless, inert material and better than 90 percent removal efficiencies for BOD, phosphorus, iron, and zinc and better than 80 percent nitrogen removal. Disadvantages include the pretreatment requirements for grit removal and equalization and large chlorine requirements as chlorine gas is hazardous to handle and use.

10. Aquaculture. Natural processes of ponds and marshes can also purify septage. Wastewater is biologically processed in a complex ecosystem and treated by evapotranspiration and percolation. Wetland systems can achieve higher removal efficiencies than mechanical systems. Ecological Engineering Associates' Solar Aquatic Wastewater Purification System is an experimental septage treatment system which has not as yet been approved by the DEQE. A pilot project in the town of Harwich, MA was in operation during the summer of 1988. Harwich is currently in the process of putting together a contract with Ecological Engineering Associates for the operation of a year round treatment facility with a capacity of 4,800 gallons per day. Treatment takes place in 4 steps: 1) Holding Tanks. Septage enters into primary settling lagoons. 2) Tanks 1-10. Following the lagoons ten tanks form an artificial river. 3) Marsh. A long narrow constructed marsh including bulrush and cattail follow these tanks. Pathogenic bacteria is reduced by plant action and nitrates are reduced to nitrogen and gas in the sand and stone substrate. 4) Tanks 11-21. The remaining tanks polish the effluent which results in high quality water.

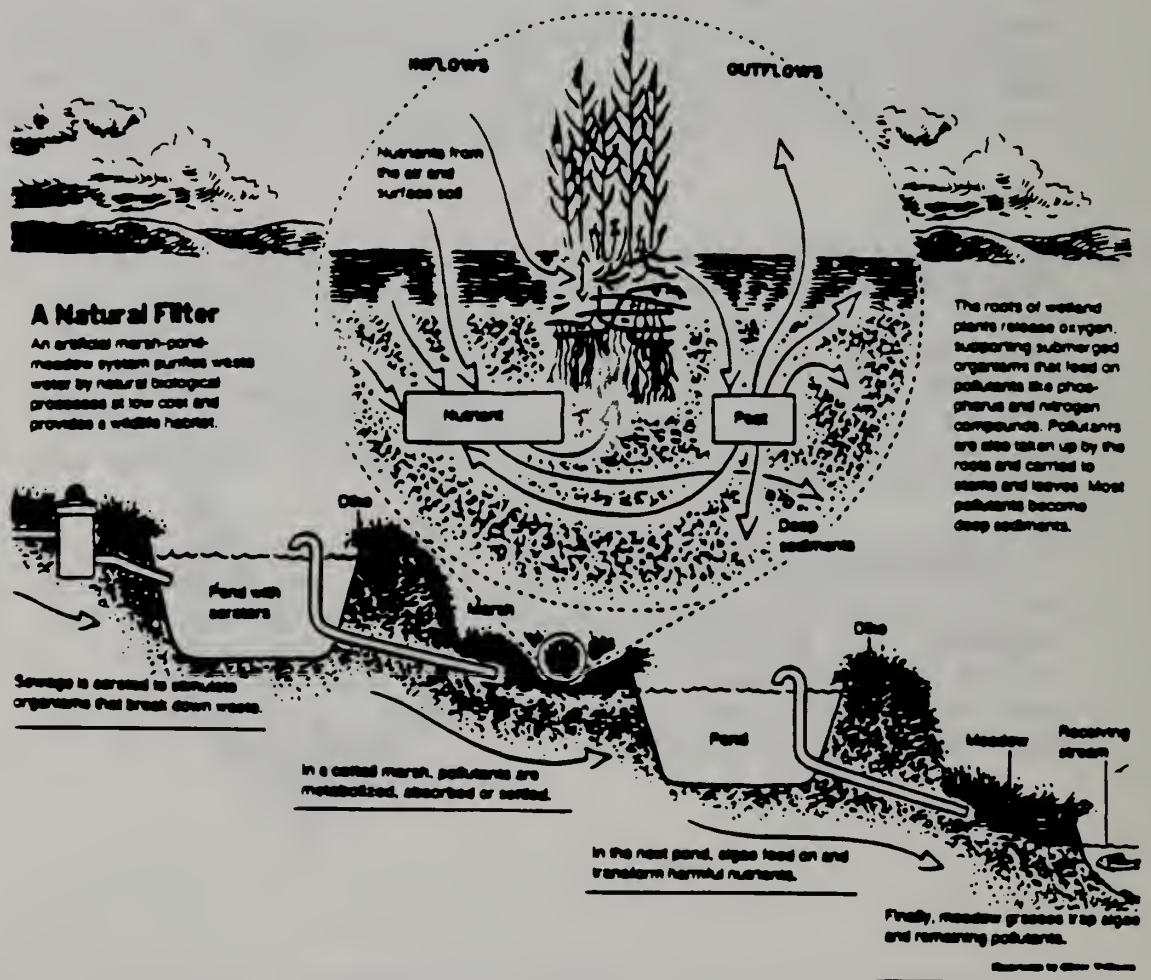


Figure 5-3
A schematic drawing of the Aquaculture septage management concept.

Chapter 6

SEPTAGE MANAGEMENT OPTIONS

Septage management involves the control of the collection, hauling, treatment, and the disposal of the material pumped from septic tanks. This chapter describes the necessary functional requirements of a septage management program, discusses options available for achieving these requirements and describes examples from other locales where varying systems are used. This information is presented as an overview to provide the South Shore coalition communities with useful management options to consider for adoption.

MANAGING SEPTAGE COLLECTION

The major objectives of these programs are;

- o control of the pumping and hauling activity to guarantee that they are performed in a safe and responsible manner,
- o tracking the septage from point of generation to ultimate disposal,
- o insuring proper operation and maintenance of septic systems by controlling pumping frequency and identifying potentially problematic systems.

In a 1982 MAPC publication a maintenance program is outlined for the towns of Hingham, Norwell, and Rockland. The program is a preventative approach to problems that might result from malfunctions. There are two major components: 1) public education and 2) monitoring and enforcement by the town.

Public Education

There are a number of ways to do this: distribution of septic system brochures, press releases, local schools (hand out brochures to school children, etc.), encourage septage hauler involvement, and conduct public meetings or workshops.

Monitoring

Three monitoring options: 1) Board of Health spot checks. 2) The Board of Health could, along with a septic system brochure, notify homeowners of the need to inspect their tanks, with a mail-back response postcard as a way of monitoring system pumpouts. 3) Licensed pumpers could be required to submit to the Board of Health receipts

signed by homeowners whose systems have been pumped (see Appendix F). This would require the adoption of a Board of Health regulation (see Appendix G).

Mandatory Inspection and Maintenance Program

A mandatory program may be necessary to assure compliance. The program could include a requirement for registration and periodic inspection under state enabling statutes. The program would require coordinated private and municipal efforts. Additional funding for these programs would be required to administer these programs. Such a program should be adopted if adequate disposal capacity exists to treat the septage which would be generated.

Three Model Inspection and Maintenance Programs are described below:

1. Municipal Inspection with Publically-Owned Pumping Service full municipal control (see Appendix H). A town bylaw or board of health regulation should be adopted to implement the above program. The bylaw should include the following:
 - a. authority and direction of the board of health to run the program,
 - b. deem failing systems as a nuisance and require inspection, cleaning or repair,
 - c. adopt rules and regulations; inspections, permits, maintenance, pumping and disposal, fees.
2. Municipal Inspection with Private Pumping Service with partial municipal control, a town could avoid getting into the septage hauling business (see Appendix I).
 - a. this approach requires the board of health to inspect systems at least every three years,
 - b. haulers issue each homeowner a receipt upon service and sends a copy to board of health
 - c. a regular inspection schedule should be developed.
3. Private Inspection and Privately-Owned Pumping Equipment with policy and legislative support the program could be run by private firms (see Appendix J).
 - a. program implementation by local health regulation requiring homeowner septic tank maintenance permits,
 - b. permits include hauler certification of inspection and/or pumping (no pumping necessary if scum is 1/3 of tank volume).

Septage Tracking Systems

With an inspection and maintenance program there will be an increase of septage to be managed. A viable tracking system should be implemented. The governmental agency who is operating the inspection and maintenance program (in most cases the Board of Health) should be in close cooperation with the facility operator. A model pumping permit is included in Appendix F.

Administration and Enforcement

New programs exert increased administrative burdens. Sharing administrative burdens by creating a regional health district with neighboring towns can reduce staff time and costs and foster uniform adoption of standards. Some of the advantages of a regional health district are as follows:

- 1) provides professional environmental health expertise
- 2) costs are shared
- 3) towns need only to belong yearly and can withdraw if desired
- 4) each local Board of Health retains its home authority

The Nashoba Associated Boards of Health is an example of such a District. The Nashoba District includes 16 member towns located in North Central Massachusetts. The District was established in 1930 upon recommendation from the U.S. Public Health Service following a survey investigating disease transmission in the area. The legislative basis upon which the association is formed is Chapter 111, Section 27A of the Massachusetts General Laws. All the member Boards of Health collectively form a joint committee established by the law to oversee the operations of the agency, however, in individual town health matters each municipal board retains its complete authority and may allow the agency to act on behalf or instruct the agency as to what specific course of action to employ. The large array of available services at reasonable per capita costs makes the economies of scale very attractive to member communities. And, the local health boards enjoy the arrangement because it relinquish most of the routine hassles to the agency.

Other regional health districts include:

- Tri-Town Health Department -- Lee, Lenox, and Stockbridge in
Western Massachusetts
- HEM Regional Health District -- Hamilton, Essex and
Manchester, northeast of Boston
- BTW Health District -- Boxford, Topsfield and Wenham, north
of Boston
- Barnstable County Health Department -- 15 towns on Cape Cod

RHODE ISLAND WASTEWATER MANAGEMENT DISTRICTS

In 1987 the State of Rhode Island adopted enabling legislation for the creation of ordinances authorizing Wastewater Management Districts. These districts are designated to eliminate and prevent contamination of state waters through septic system inspection and maintenance programs. The management program works as follows:

Inspection is a key component. The legislation enacted in 1987 enables municipalities to allow for the passage of septage haulers and district officials onto private property for inspection. Inspectors must be adequately trained and be able to detect subtle and flagrant signs of system failure.

Property owners should be notified of inspection schedules. This can be done by direct mailing, advertisement in the local newspapers or a notice posted in town halls and other municipal buildings.

Inspection

Septic System Inspection should at a minimum include:

1. Septic Tank Sludge Levels - If sludge accumulates to a depth of $\frac{1}{3}$ the distance to the leach field outlet or 16 inches in depth the tank should be pumped (or automatically require periodic pumping of all systems on a regular basis such as every three years).
2. Surface Break Out - indicates failure.
3. Lush Plant Growth - system is unlikely to be operating properly.
4. Odor - strong odor indicates malfunction.
5. Trees or Shrubs - there are to be no trees or shrubs within 10 feet of leachfield.
6. Impervious Area - there should be no patios, driveways, swimming pools or other impervious surfaces over the leachfield without the approval of the Department of Environmental Management (DEM).

Management Options

To encourage compliance a district may offer a rebate to subsidize some or all homeowner's pumping costs. An annual disposal system owner maintenance fee could be a source of funds for the rebate program.

Another option would be for the district to enter into contractual agreements with private firms to have all systems automatically pumped every three years, or as needed. For example if a system costs \$150 to be pumped once every three years, a WWMD could assess a system owner \$50 per year plus an administrative charge to fund the district operations. This option may prove to be the most desirable for the following reasons:

1. Compliance with pumping requirements will be assured.
2. An efficient orderly pumping schedule can be established to avoid overloading of septage facilities.
3. It will be easier to keep maintenance records.
4. Septage can be more readily traced to insure proper disposal.
5. Disposal system owners could be eligible for a reduced group rate from private pumpers.
6. The District can be sure that system pumpers are properly trained and licensed.

Following Inspection

If the system appears to be malfunctioning, the owner should be given a written notice indicating probable cause and recommended corrective actions. The homeowner should be given a time frame within which they must contact the DEM and apply for the necessary permit to repair the system. And, additional time frames for each individual action should be established to complete all necessary repairs

If a system has not failed but requires pumping, the owner is required to show proof that the system has been pumped within 30 days. A receipt from the pumper may be considered adequate proof.

Public Education

Public education is a critical part of any waste water management program. People have to be convinced of the pollution causing potential of on-site septic systems. Pamphlets, public information meetings, and newspaper articles are a few means for reaching the community. The district should initiate an on going residential education program. The simple fact that the less water going into the system the better it will operate. Water saving devices could be distributed.

In addition, the homeowner should be cautioned against pumping during the months of December through March in areas with high water tables. A high water table may cause a tank to become buoyant and be pushed out of the ground or tilt once contents have been removed.

Financing

The enabling legislation empowers municipalities to raise funds for the administration and operation of the district. There are a number of options to consider for establishing an operating budget. However one simple and equitable means would be to charge each homeowner an annual flat rate based on dwelling units owned. A higher fee may be assessed from industrial or commercial systems. The fees could cover the annual operating costs or a reserve fund could be developed to assist needy homeowners.

Financial Assistance

Some systems will be beyond the scope of maintenance and need to be replaced. When a situation arises that a homeowner cannot afford to repair a system, the district has authority to issue bonds to obtain funds that can be allocated as grants or low interest loans. If an entire neighborhood needs their systems' repaired, it may be necessary to design an expensive community system. The district can offer financial aid to solve the problem.

Enforcement

The effectiveness of any ordinance is only as good as its enforcement. The WWMD has the authority to take some strong enforcement measures if necessary. The district may levy fines for non compliance, which can go as high as \$500 per day.

Septage Disposal

A key factor to consider prior to implementing a septic system maintenance program is the proper disposal of septage. Clearly the septage disposal problem must be resolved before adoption of large community maintenance programs.

Conclusion

Wastewater Management Districts are a realistic and affordable solution to the problems of failing septic systems. Proper maintenance benefits homeowners and the community both environmentally and economically. Although a WWMD may require hard work to establish, the payoff benefits everyone.

Current Status

When the WWMD legislation was first adopted the implementation was slow in coming. It took a lot of public education. Following public education many communities were very interested and active in getting districts established. Meanwhile, a greater problem was brewing at the other end of the treatment process. The RI DEM decreed that sludge disposal at the state-run landfill (the only available sludge disposal facility in RI) was to stop. The adoption of Wastewater Management Districts has presently ceased. However, the Narragansett Bay Commission (Providence, RI's Water Treatment Facility) has undertaken a small pilot project, an aquaculture wastewater treatment facility. The Commission is engaged in a 10 year contract with

Ocean Arks International and Ecological Engineering Associates of Woods Hole, Massachusetts to manage an aquaculture treatment facility. The facility will be open in July, 1989. Because there is a concern with heavy metals from local industries, the pilot project will determine if this process is a viable solution for Narragansett Bay.

MANAGING SEPTAGE TREATMENT AND DISPOSAL

Chapter 5 reviewed the alternative septage treatment methods available to communities. This section outlines options for management of disposal which could be used by communities in managing any of the treatment methods selected for implementation.

Under the provisions of MGL 111, Section 31D, the DEQE may recommend necessary action if it finds that septage disposal facilities in a community are inadequate. If a city, town or sewage district fails to act on such a recommendation in a reasonable time, the DEQE may issue an order for the provision of adequate facilities for septage disposal. The law allows communities to establish charges to cover the cost of construction, operation, and maintenance of disposal facilities. It also allows communities and sewage districts to form joint regional facilities.

There are three models for communities to follow in providing the adequate septage treatment facilities required by MGL Chapter 111, as summarized below.

1. Single Community Treatment Facilities

Under this option, a community could construct and operate its own treatment facility, which may consist of co-treatment at a sewage treatment plant, or treatment of septage at a dedicated facility. Examples of this approach on the South Shore include Hull, Rockland, Scituate, and Marshfield, all of which use co-treatment. However, in many communities the economies of scale may make it difficult for a single-town plant to be economically viable.

2. Regional Treatment Facilities

Two or more communities may develop and operate a joint treatment facility to serve the needs of participating communities. The towns of Sudbury and Wayland operate such a facility. Weymouth and the Hingham North Sewer District also participates in a regional system, the MWRA. The advantage of this approach to small communities is that economies of scale can result in lower disposal costs.

3. Intermunicipal Agreements

Communities without individual or regional treatment facilities may enter into agreements with other existing facilities for disposal of septage. Such agreements exist between the Upper Blackstone facility and the towns of Hanover and Cohasset.

Cohasset also has an agreement with Hull which is not currently in effect because of financial problems. Agreements usually specify the cost of disposal, the quantities which will be accepted and restrictions on the quality of septage. The advantages of agreements are that communities "pay as they go," but do not incur the capital expenses of constructing their own facility. The disadvantages include uncertainty over future availability and cost, and in some cases, greater hauling distances which increase disposal costs.

Table 6-1 summarizes the current status of the South Shore communities' disposal management.

Table 6-1
Disposal Management

Community	Single Community Facility	Regional Facility	Intermunicipal Agreement	No Disposal Option
Cohasset			X	
Duxbury				X
Hanover			X	
Hingham				X
Hull	X			
Marshfield	X			
Norwell				X
Rockland	X			
Scituate	X			
Weymouth		X		

FINDINGS AND RECOMMENDATIONS

The purpose of this chapter is to summarize the findings and present recommendations addressing septage collection and disposal for the region. The recommendations include septic system maintenance programs and Board of Health tracking of septage and configurations for septage disposal alternatives. In addition, the legal, institutional, and financial requirements associated with the various recommendations are outlined. The intent of this presentation is to generate some discussion and action among the South Shore Coalition communities.

FINDINGS

Disposal

Before outlining the various alternative configurations it is helpful to categorize the existing management practices. The ten South Shore communities comprising the study area can be defined by several scenarios (see Table 7-1 and Figure 7-1):

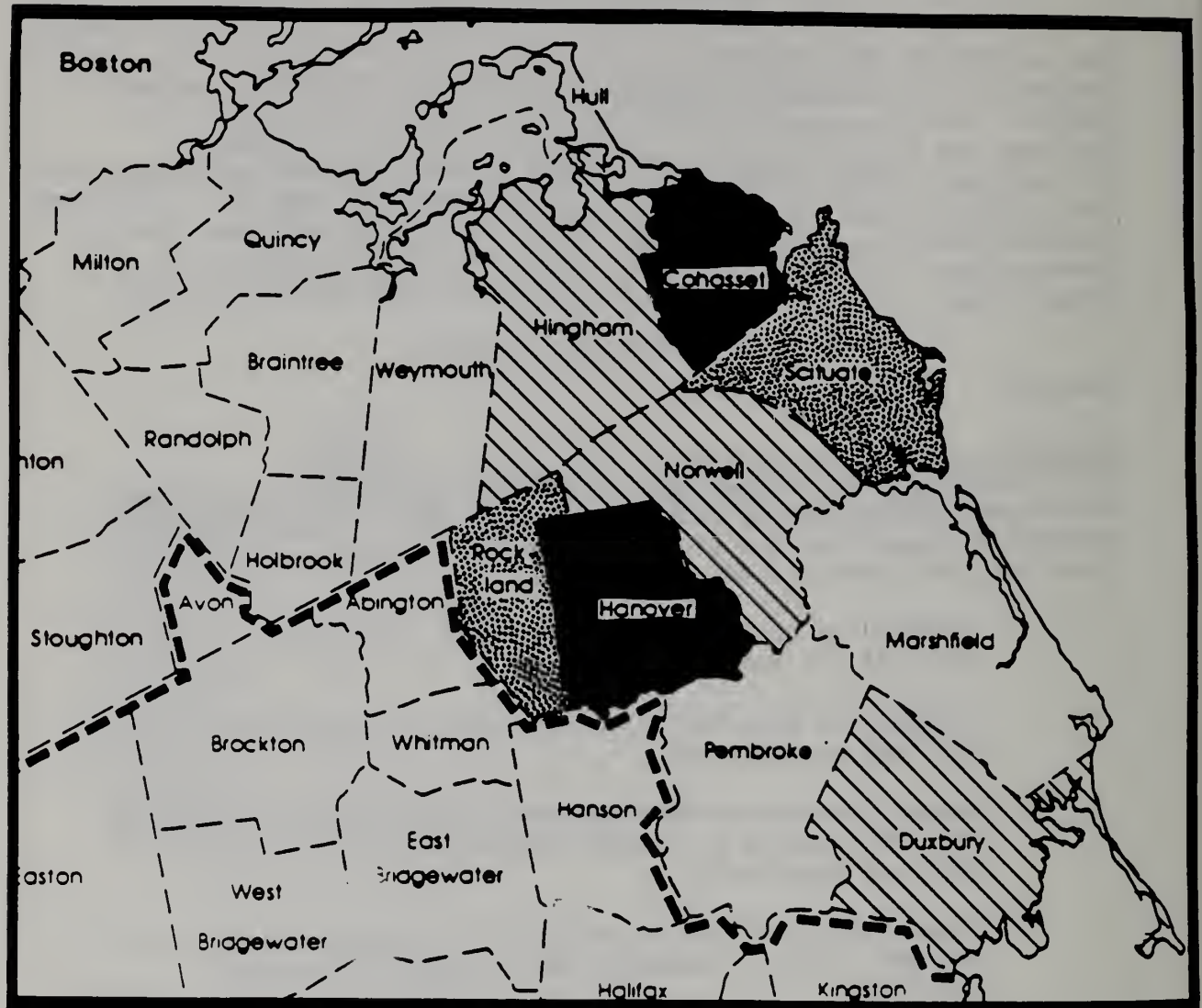
- o communities contracting with distant private facilities:
Cohasset and Hanover;
- o communities with facilities at, near, or over capacity:
Rockland and Scituate;
- o communities with a facility (or planned facility) having an available excess of septage receiving capacity: Duxbury*, Hull and Marshfield;
- o communities with public contracts for septage disposal at a regional facility: Weymouth and Hingham North Sewer District;
- o communities without any septage disposal arrangements:
Hingham and Norwell.

Table 7-1
Current Septage Disposal Scenarios




Facility- over capacity	Facility- adequate capacity	Private contract	Public contract	Nothing
Rockland	Duxbury*	Cohasset	Weymouth	Hingham
Scituate	Hull	Hanover	Hingham/ North Sewer District	Norwell
	Marshfield			

* private facility, no contract or agreement with the town.

Figure 7-1



Septage Disposal Problem Identification

-  No Designated Facility
-  Capacity Deficit
-  Short-term Contracts and Long Hauling Distances

Collection

Title 5 of the Massachusetts Environmental Codes states that all systems must be inspected and cleaned at least annually. Each of the communities in the study area rely on private septage haulers for the collection and disposal of septage. Each community is required under Title 5 to license septage haulers serving their area. The Board of Health licenses most often require a name, address, number of trucks, and a business number.

RECOMMENDATIONS

Disposal

Alternative configurations are within the context of three major concepts and each community within the Coalition study area is described within this framework:

1. Maximum reliance on existing sewage treatment facilities with the utilization of intermunicipal agreements;
2. establishing individual septage handling facilities for communities in need of additional disposal capacity; and
3. creating regional septage treatment facilities for communities in need of additional disposal capacity.

Reliance on Existing Facilities with the Possibility of Intermunicipal Contracts

Duxbury

A private facility is currently being developed which would have adequate capacity for the town of Duxbury. The town is in the permit stage of a proposed private operation with a 50,000 per day capacity. The Duxbury Board of Health could designate this facility as the assigned community disposal site and enter into an agreement with the facility. A neighboring community such as Norwell could also enter into agreement for disposal with the facility.

Hull

The Hull Pollution Control Facility can accept 20-25,000 gallons per day from outside communities. In the past it had arrangements to accept 2,000 gallons per day from three communities in the study area, Cohasset, Hingham and Norwell. However the Hull landfill has been temporarily closed, no longer taking the end product of sludge from the Pollution Control facility. The Hull landfill has a small life span and continuing the practice of accepting sludge will shorten it even more. Without an adequate sludge disposal site, the facility can not accept septage from neighboring communities. The sludge produced at the plant now is shipped to Rhode Island. There is concern that this may not be allowed to continue. Presently the facility is actively searching for alternative sludge disposal

sites. The communities that were able to dispose of septage in Hull in the past may be able to help alleviate the sludge problem in return for septage disposal capacity at the Hull treatment plant. The communities could possibly landfill some of the sludge. However, DEQE is concerned with the management of sludge and is interested in limiting disposal sites.

Marshfield

Marshfield will soon be accepting septage at their municipal wastewater treatment facility. The system's treatment capacity is greater than what the community will use. Marshfield could possibly enter into a disposal agreement with Scituate or another neighboring community.

Rockland

Rockland can continue to rely on their current practice of co-treating septage in the municipal wastewater treatment system. The Rockland treatment plant can handle up to 10,000 gallons per day of septage. Rockland currently disposes approximately 2,000 gallons per day of septage into the facility. Therefore there is the possibility that Rockland could enter into an intermunicipal agreement with a nearby community to assist in the region's disposal needs.

Regulations Regarding Intercommunity Disposal

The legal and institutional requirements for communities to enter into disposal agreements are established under Title 5 of the State Environmental Code 15.19s5. The code states that the contents of septic systems and other sewage or waste receptacles originating in a city or town may be disposed of in a sanitary manner in any other city or town subject to written approval of the Boards of Health of the municipalities in which the wastes originate and the disposal works are located, and the written approval of the Authority having control of the sewer or disposal site.

ESTABLISH INDIVIDUAL SEPTAGE HANDLING FACILITIES OR REGIONAL SEPTAGE TREATMENT FACILITIES.

Scituate

Although Scituate has been co-treating septage in a municipal wastewater facility, it could benefit from an increase in septage handling capacity. Scituate's wastewater treatment facility is at, or near capacity for septage.

Cohasset and Hanover

The communities of Cohasset and Hanover have contracts with Upper Blackstone Regional Facility in Millbury, Mass. Due to long hauling distances and short term contracts, this arrangement is considered to be interim. Cohasset and Hanover will need to look to future long term solutions, which may include developing new facilities or entering into intermunicipal agreements with nearby communities.

Hingham and Norwell

The town of Hingham and Norwell not only need long term solutions but they currently are without short term arrangements. The Hingham Sewer Department has been in contact with the MWRA to discuss the possibility of allowing the entire town to dispose into the Night Soil facility currently restricted to a small section, the North Sewer District. The MWRA agreed to consider this request; therefore, this may prove to be an option for Hingham. Otherwise, Hingham as well as Norwell need to pursue independent arrangements or regional approaches to septage treatment.

Independent or Regional Facility

With several communities needing additional capacity it is clear that additional septage handling facilities are needed. The communities can remain independent by constructing individual facilities. However, this alternative may prove to be more costly. It has been estimated in other septage studies done for the South Shore that a regional facilities would be cost effective due to the economies of scale (see Appendix K). In addition, it is possible that one or two communities have an available site while other towns may be without a suitable tract of land.

Legal and Institutional Requirements for the Establishment of Regional Facilities

There is a legal framework available for communities to establish regional facilities. MGL 40 s. 4A states that any governmental unit (city or town) may enter into an agreement with one or more other governmental units to perform jointly any service, activity or undertaking which each contracting unit is authorized by law to perform. Since Chapter 111 s. 31D authorizes cities and towns to dispose of septage, the provisions of chapter 40 s. 4A would enable regional groupings of communities to perform this function.

TREATMENT FACILITY OPTIONS

The two recommended septage treatment facility alternatives recognized in this study to be taken into consideration for an independent or regional facility are, the Rotating Biological Contactor (RBC) and an aquaculture system, the Solar Aquatic Wastewater Purification System (see chapter 5). Other alternatives such as land application and composting require large land areas or available agricultural lands, both of which are uncharacteristic of the South Shore study area.

Costs

Rotating Biological Contactor

The capital costs for a Rotating Biological Contactor treating 50,000 gallons of septage per day is approximately \$2 million. The area necessary for siting a facility is about 3-5 acres. The site includes about 1 acre leaching area, a 20,000 s.f. building, underground tanks and buffer zones. The operational costs can be about \$90,000 per year. The operating costs include engineers, electricity and chemicals. Table 7-2 illustrate the general cost breakdown.

Table 7-2

Estimated Septage Treatment Facility Costs -- Rotating Biological Contactor

Construction

Equipment/External Tanks/Compost Area/Mixing	\$	1,100,000.00
treatment Building		150,000.00
Contractor/Engineering Administration		100,000.00
Total	\$	1,350,000.00

Miscellaneous - add site specific work for clearing, filling/cutting, leaching area, access road, signs, wetlands protection, design/land acquisition/environmental studies, etc.

Operation and Maintenance (yearly)

Treatment Plant Operator		
one grade 5 or 6	\$	35,000.00
one grade 3		25,000.00
Engineering Supervision		6,000.00
monthly effluent sampling		10,000.00
and screening of incoming waste		
Maintenance, Chemical and Electricity		15,000.00
Total annual costs	\$	91,000.00

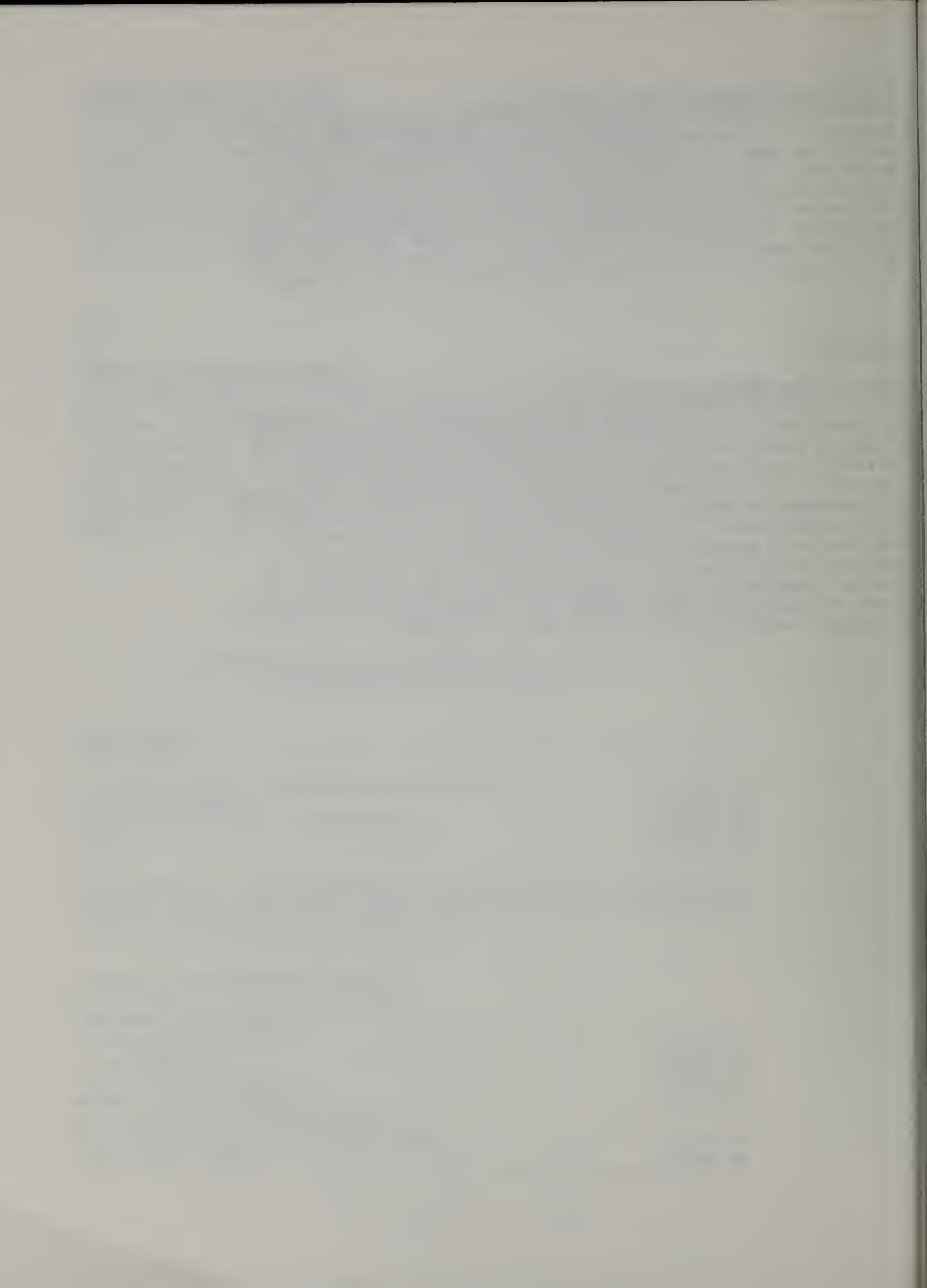
Solar Aquatic Wastewater Purification System

Presently the Aquatic Wastewater System is undergoing DEQE review for approval as a treatment method in MA. The system is relatively new and has not been in operation long enough to give hard and fast guidelines. The proposed plant for the town of Harwich will be treating 25,500 gallons per day of septage. The capital costs for the systems is \$3 million. Ocean Arks International and Ecological Engineering Associates, the designers of the Solar Aquatic systems are interested in privatizing the system. Establishing the system in this manner will cost \$15 per 1000 gallons of treated septage.

Collection

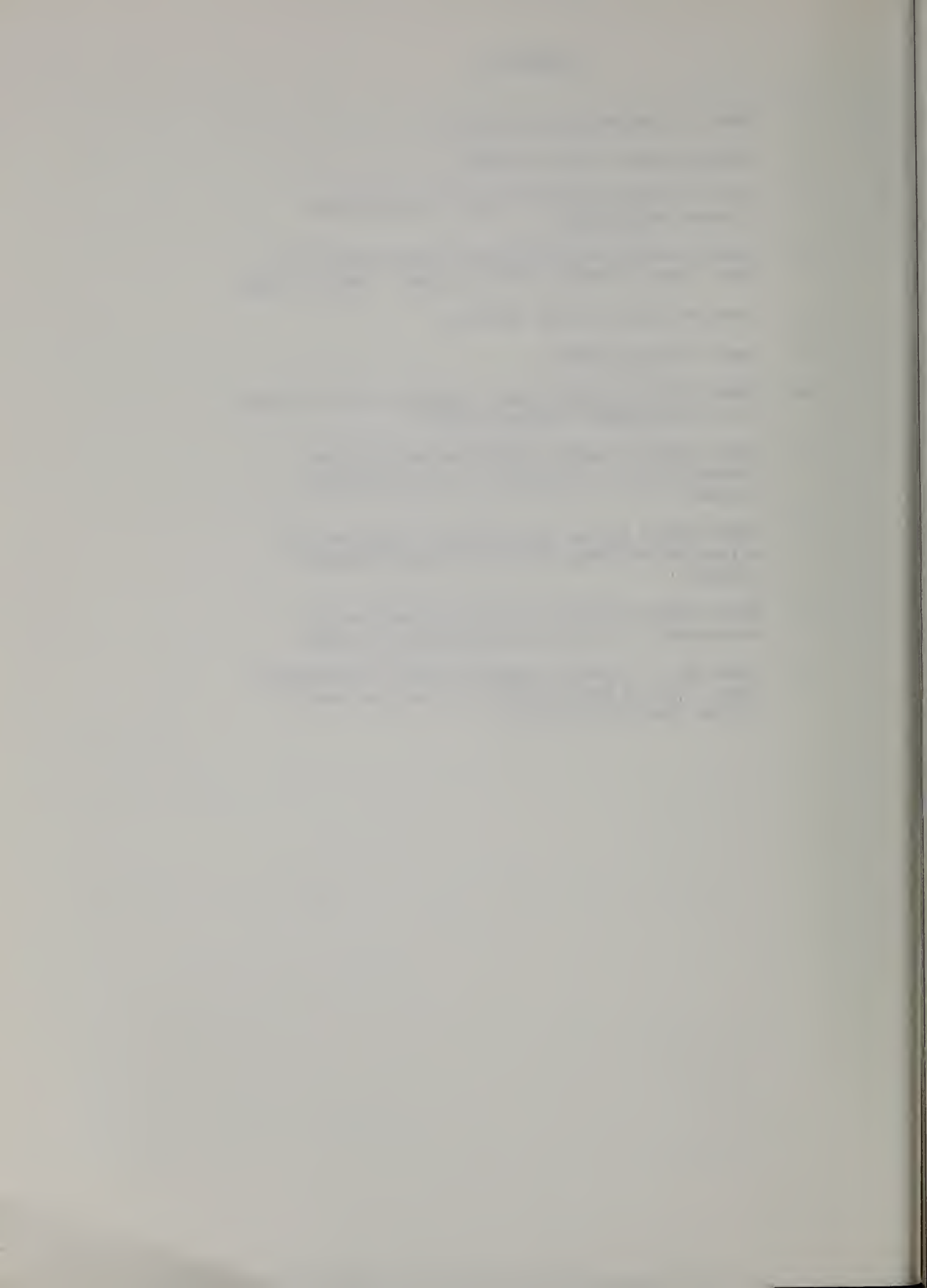
Septic System Maintenance Programs

Septic system maintenance programs (see Chapter 6) could be adopted by communities with appropriate septage disposal facilities, Hull, Hingham's North Sewer District, and Rockland. Likewise Duxbury and Marshfield could follow once the upgrade systems come on line. Eventually all of the South Shore study area communities should have such programs in practice. Consequently, the Title 5 requirement of annual septic system inspections would be more strictly enforced. In addition, more extensive licensing requirements of haulers and septage tracking programs could be adopted by the local Boards of Health. Engaging in these programs will place demands on the local Boards of Health and could possibly be alleviated via the creation of a regional health district (see Chapter 6, p. 6-3).



APPENDICES

- A Board of Health Survey and Data
- B Septage Hauler Survey and Data
- C Town of Chatham, Board of Health, Real Estate Transfer Regulations
- D Septage haulers raise prices as lagoon dumps shut down, Peyton Fleming, Patriot Ledger. March 4, 1989.
- E Treatment Plant Survey and Data
- F Sample Pumping Permit
- G Model By-law for municipal inspection and maintenance of on-site sewage disposal systems
- H Model Board of Health regulation for municipal inspection and maintenance of on-site disposal systems
- I Model Health By-law for municipal inspection and private maintenance of on-site sewage disposal systems
- J Model Health By-law for private inspection and maintenance of on-site sewage disposal systems
- K Summaries of previous Septage Studies for the South Shore, Town of Norwell Facility Plan and Town of Hingham Feasibility Study.



Appendix A

South Shore Septage Management Study
Board of Health Survey

Municipality name _____
Health Officer\Director: _____
Health Agent\Sanitarian: _____

Present sewerred population: _____

Present unsewerred population: _____

Approximate number of households not sewerred: _____

single family multi-family

a. septic systems _____

b. cess pools _____

c. holding tanks _____

d. private WWTP (condominium Apartment Buildings) _____

Do you experience a significant seasonal fluctuation in population?

Yes _____ No _____

Approximate peak population number: _____

Number of months per year at peak: _____

Estimated % of total population unsewerred during peak: _____%

Estimated number of commercial business holding tanks: _____

Estimated number of grease traps: _____

Estimated number of industrial septage holding tanks: _____

Do you currently license or permit septage hauler(s) in your
city\town? Yes _____ No _____

What are the requirements and fees for obtaining a license or
permit? _____

Do you currently utilize a septage\sludge ticketing or tracking
system? Yes _____ No _____

If yes, please explain how the system
works: _____

If no, are you thinking of instituting such a system: Yes _____ No _____

Do you presently have a viable septage disposal location for the
short and long term? Yes _____ No _____

If yes, please explain: _____

If no, what steps are being initiated to provide proper disposal? _____

Do you currently have any intermunicipal agreements for disposal of septage? Yes _____ No _____

List communities and terms of agreement: _____

Please list any septage disposal locations (and aproximate associated volumes) approved by the BOH:

<u>Name</u>	<u>Address</u>	<u>Volume</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Do you know of any private lagoons or disposal pits being utilized for septage disposal? Yes _____ No _____

If yes, please list name and location:

<u>Name</u>	<u>Address</u>
_____	_____
_____	_____
_____	_____

Does your town have a site assigned for septage holding or transfer? Yes _____ No _____

Have complaints or problems arisen from sites\facilities approved by the BOH? Yes _____ No _____

If yes, please explain: _____

Are you currently involved in facilities planning for the construction of septage or wastewater treatment facilities? Yes _____ No _____

If yes, in what stage of the process are you presently engaged? planning _____ design _____ construction _____ other _____

If no, are you interested in pursuing this course of action? Yes _____ No _____

If no, why not _____

Have you entered into discussions aimed at developing a regional approach to septage\sludge disposal? Yes _____ No _____

If yes, please explain _____

If no, would you be interested in undertaking this approach? Yes _____ No _____

Do you currently require and/or track septic system maintenance and inspection programs? Yes _____ No _____

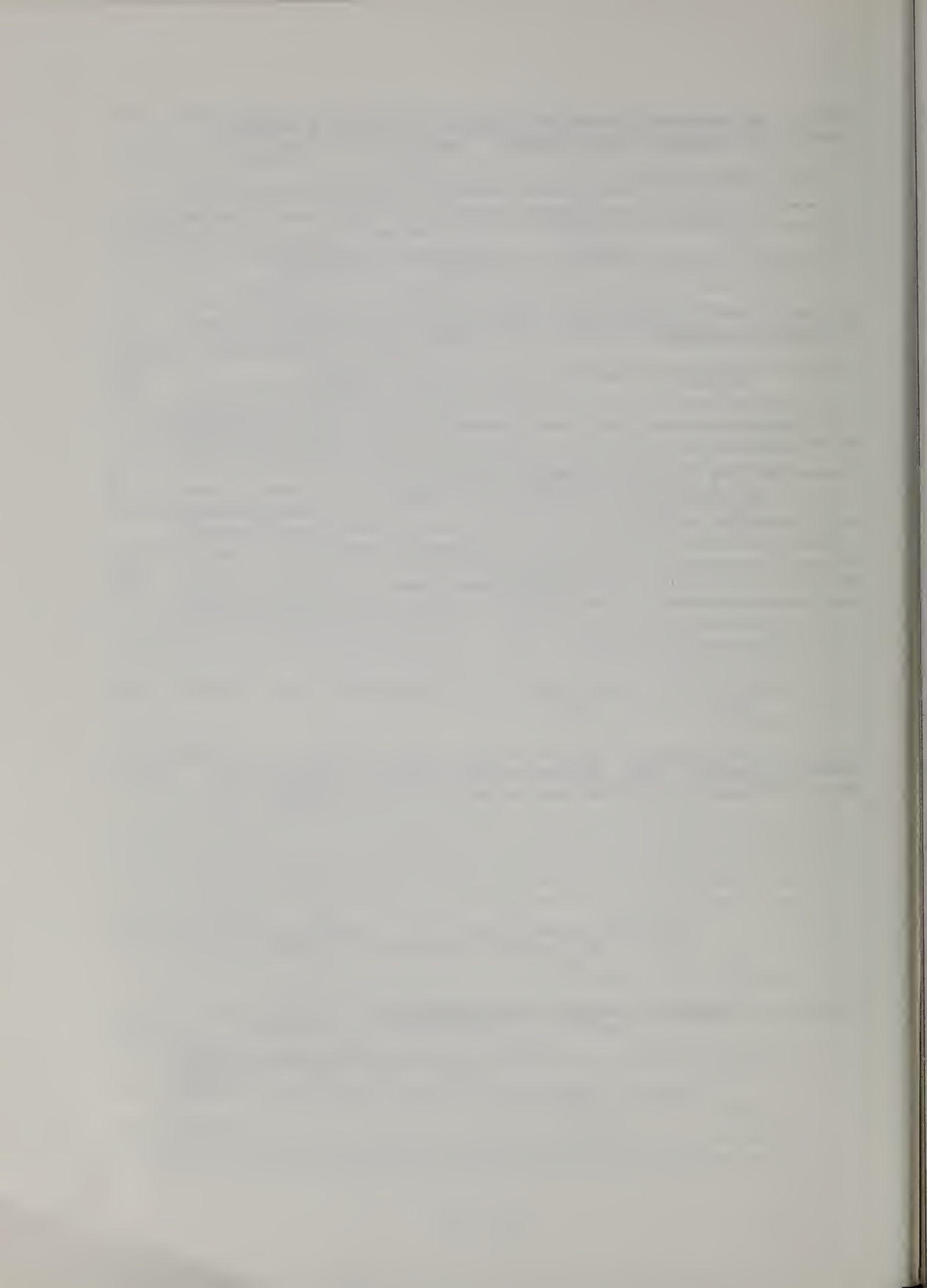
If yes, please explain how often (and how extensive): _____

Please make any additional comments you wish: _____

Thank you for your time. If you have any questions please contact Martin Pillsbury or Nora Kelleher at MAPC at (617) 451-2770.

Signature of person filling out this questionnaire:

_____ Date



Appendix A
DEGE
BOARD OF HEALTH QUESTIONNAIRE

Town:	Cohasset	Hanover	Hingham	Marshfield	Norwell	Weymouth
Director:	J.R. Godzik VMD		B.T. Caplan RS.	Peter Falabella	Lester C. Hiltz	Richard Marino
Sanitarian:		Mr. Simons		Christine Ryan		
Population Estimates:						
1988-	7,300	11,800	21,000	23,000	10,000	55,000
1990-	7,300	12,100		24,000	10,500	56,000
2000-	7,800	12,400		28,000		61,000
2010-	8,200	12,800				65,000
Present unsewered population:	6,800	11,800	16,800	18,400	10,000	7,800- 10,400
Population per household:	2.5	4	2.3	3	3	2.6
Households not sewerd:	2,600					3,000
# single-family with septic system:	2,500	all	3,000	6,960	8,000	1,000
# multi-family with septic systems:	330	500	250			100
# single-family cesspools:	3,000		2,000		2,000	1,600
# multi-family cesspools:	660					100
# single-family holding tanks:	1		10	1		
# of private WWTTP:	80					
Peak fluctuation in population:				32,000		55,000
# months/year at peak:				3-4 months		9.5 months
% population unsewered during peak:				80		22
# commercial holding tanks:	1 @ 8,000 gal		2 @ 5,000 gal	11		
# grease traps:	15 @ 2,500 gal	20 @ 1,000 gal	80 @ 1,000 gal		20	300
# industrial septage holding tanks:			30 @ 2,000 gal			
# industrial holding tanks (non-domestic):				10		
Licensed haulers:	AAA Atlas Alpha Sanitary C. Spirito E.L. Margetts P.F. Spencer Jr Roderiques & Sons Rooteraan Rosano & Davis	A Able Pumping A-1 Sanitation C. Spirito Dana Mash Pump Earl Simons Pilgrim Pump Vita Bac	A-1 Sanitation Alpha & Ohan Sewage Anderson Pumping C. Spirito Dana Mash Earl Simons E.L. Margetts John Papasordero Northern Waste Rooteraan Roto Rooter			

Septage/Sludge disposal ticketing or tracking:	tracking	tracking	tracking	tracking	tracking
Explain system:	truck inspections pumping reports \$50 in 1989 \$100 fee hauler reports	\$15 fee	requirements	DOH & DPW	spot checks
Viable short and long term disposal locations:	Yes	No	Yes	Yes	Yes
If yes explain:	Hull WWTP - (2,000 gpd) U. Blackstone Ritters 6,000 gpd	Earl Simmons (4,000 gpd)	WWTP - upgraded lagoons at town landfill	Hull WWTP	MURA (grade A only)
Intermunicipal agreement:		No			MURA
Septage pits or lagoons now being utilized:	No	Ritters			Yes
Initiating proper disposal:					

BOARD OF HEALTH QUESTIONNAIRE

Town:	Scituate	Rockland	Hull	Duxbury
Director:	Jennifer Lamb	John Boyle	Kevin O'Brien	Anthony V. Carmello
Sanitarian:				Registered Sanitarian
Present sewer population:	5,400	12,000	60%	600
Present unsewered population:	12,600	5,000	40%	14,000
Households not sewerd:	4,000	?		
# single-family with septic system:	2,500		10%	
# multi-family with septic systems:	330			
# single-family cesspools:	3,000		30%	
# multi-family cesspools:	660			
# single-family holding tanks:	1			None
# of private WWTP:	80			None
Peak fluctuation in population:	Yes	No	Yes	16,000
# months/year at peak:	3		3-4	2
population unsewered during peak:	21,000		20,000	
% of total population unsewered during peak:			50%	

# commercial holding tanks:			None	None
# grease traps:			20	5
# industrial septage holding tanks:			None	None
# industrial holding tanks (non-domestic):				
Do you license haulers	Yes	Yes	Yes	Yes
Permit Fee:		\$40 annually		\$100 annually
Septage/Sludge disposal ticketing or tracking:	ticketing	Yes	No	they track system maintenance and construction on new houses or house addition construction
Explain system:	Driver stops at WPCP and leaves ticket with volume and address BOH requires all haulers to submit monthly records of addresses with amounts pumped These are audited against the WUTP records of sewage disposal tickets			
Viable short and long term disposal locations:	Yes	Yes Town TP	Yes Sewer Plant	Yes Keene Street Duxbury
If yes explain:	Septage facility put on line in 1984 2 privately owned leaching lagoons one of which is under litigation			
Intermunicipal agreement:	No	No	No	Yes with the Town of Marshfield --- allowed to connect to Marshfield sewer
Septage pits or lagoons now being utilized:	No			Yes South Shore Pumping, Inc Peacock Lagoons
Problems from facilities?			odor	
Initiating proper disposal:				Yes - private enterprise
Septage Facility:	Scituate WUTP	Rockland TP	Hull Sewage	
Address:	Driftway		1111 Nantasket Ave	
Volume:	20,000 gpd			

Septage holding or transfer:

No

Yes

Currently involved in facility
planning? What stage:

Yes
planning

No

No

Yes
Design

Interested

Yes

Interested in discussing
regional approaches:

Yes

Yes

Comments:

Hull is presently
expanding their
sewer system. By
fall 1989, 70-80%
of Hull will be
sewered

Appendix B

South Shore Septage Management Study
Septage Hauler Survey

1. List the towns in which you pump and note if you hold a permit from that town?

<u>Communities</u>	<u>Permits?</u>	<u>Communities</u>	<u>Permits?</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Do the towns in which you pump have sites assigned for either transfer and/or the disposal of septage? Yes _____ No _____
If yes please list: _____

3. Please list all locations where you dispose of septage and the approximate percentage of your load which goes to each disposal site:

<u>Facility</u>	<u>Town</u>	<u>Percentage</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

4. Are there any other disposal sites you prefer to use? Why? (location, cost, etc.)

<u>Facility</u>	<u>Town</u>
_____	_____
_____	_____
_____	_____

5. How many septage pumping trucks do you operate and what are their capacities?

<u>Number of trucks</u>	<u>Capacity</u>
_____	_____
_____	_____
_____	_____
_____	_____

6. How many trips are made to the disposal site(s) daily, weekly, or monthly? (by each truck or total of all trucks) _____

7. Have you ever been refused to dump at a disposal site? Yes No
Facility Location Reason for refusal

8. What is the average distance that you currently travel to a disposal site? _____ miles _____ maximum _____ minimum
9. How many customers are on a regular pumping schedule and what is the average pumping frequency?
- | | Number of Customers | Pumping Frequency |
|-------------|---------------------|-------------------|
| Residential | _____ | _____ |
| Business | _____ | _____ |
| Industry | _____ | _____ |
10. Do you dispose of grease from restaurants or other facilities? Yes _____ No _____ If yes, how many customers do you serve _____?
11. Do you service cesspools? Yes _____ No _____
 If yes, approximately what percentage of your customers have cesspools? _____ %
12. Do you do much pumping at night (restaurant, emergency, etc.)? Yes _____ No _____ If yes, please explain _____

13. How many emergency calls do you make a week? _____
14. What is the average total volume of septage pumped yearly?
 _____ gallons
 What are the approximate seasonal disposal totals?
 Fall _____ gallons Winter _____ gallons
 Spring _____ gallons Summer _____ gallons
15. What do you pay in dumping fees? _____
Disposal Facility Dumping Fee

16. How has disposal been a problem? (cost, availability, regulations, etc.)

17. Do you see the need for additional disposal sites? _____
 If so, please note location(s) where most needed: _____

MAPC SEPTAGE HAULER SURVEY

Hauler:	5	8	7	14	10	17
Towns serviced and permitted:	Hanover Hingham Norwell Marshfield Scituate Weymouth [Pembroke E.Bridgewater]	Marshfield Scituate Duxbury [Plymouth Middleboro Kingston Carver Wareham]	Cohasset Hanover Hingham Hull Norwell Rockland Scituate Weymouth Braintree	Marshfield	Hull	Cohasset Hull Marshfield Norwell Scituate
Site assignment:	Marshfield (lagoons) Scituate TP Weymouth (MDC) E. Bridgewater (private) Hingham (sewer section only)	Marshfield Scituate Plymouth Middleboro Carver Wareham	Weymouth Hingham (north district) Hull Rockland Scituate Hanover with Upper Blackstone	Marshfield (lagoons)	Hull Wastewater Facility	Scituate TP Marshfield
Disposal location:		only in towns with disposal locations	Weymouth 60% Hingham 5% Hull 30% Braintree 1%		Hull 100%	Scituate Marshfield
Preferred site:	MDC sites	none	Ridders Scituate Hingham			none
Number of trucks: Capacity:	1 3500 gallons	2 2000 & 2500 gallons	2 2500 & 4000 gallons	1 2000 gallons	1 2000 gallons	1 1500 gallons
Trips to site:	varies with season		6 daily	10 loads/week	1/week	25-30/month
Refusal to dispose:	Ridders-high pH	No	Hull TP problems	Marshfield-possible contamination with oil	over daily capacity of 2000 gallons	Hull- full
Distance travelled: (miles) Max: Avg: Min:	10	8	20 10 1/4		5	5
Customers on schedule:			none because of disposal problems			
Residential:	200 yearly	1000 yearly		1000+- yearly	100 yearly	
Commercial:					4 yearly	
Industrial:						

Disposal of grease: Customers:	No	No	No	Yes 3	No	No
Service Jesspools: Percentage:	Yes 30	Yes 20	Yes 30	Yes 40	Yes 50	Yes 35
Night pumpings:	No	No	No	No	No	No
Emergency calls:	1/3 of all calls/week	4/week	all calls are emergency because of disposal problems	5/week		2-3/week
Total volume per year: (gallons)	400,000	1,500,000	no records	2,000,000	100,000	
Fall:	100,000	412,500			20,000	
Spring:	100,000	412,500			30,000	
Summer:	50,000	412,500			20,000	
Winter:	150,000	263,500			20,000	
Fees:	Ridders- \$70/1000 gal Scituate- \$35/load Marshfield- \$11/1000 gal	Marshfield- \$11/1000 gal Plymouth- \$.015/gal Scituate- \$24/load Middleboro- \$20/load	\$.05 in Hull when available	Marshfield- \$11/1000 gal	Hull \$50/load	\$15/load
Problems:	It is diffi- cult to compete with haulers disposing illegally	Availability in towns without a facility or agreement	loss of customers due to lack of availability facilities allow certain pumpers and others are unable to get permits	Availability Marshfield is open 8-3 M-F	Regulations	no problems
Need new sites:	Hingham Cohasset Hanover Hingham Pembroke Hanson	Regional- in the South Shore for those towns without facilities	Hingham (part) Cohasset Norwell and other towns without disposal plans	Duxbury Pembroke	No	Absolutely in the South Shore for week- end and night use

Hauler:	12	11	4	18	19	16
Towns serviced and permitted:	Scituate Marshfield Norvell Cohasset	Cohasset Hingham Hull Norvell Scituate	Marshfield Scituate [Plymouth Bourne]	Cohasset Hanover Hingham Hull Norvell Rockland Scituate Weymouth [E. Bridgewater Milton Quincy Hanson Abington Braintree Easton Holbrook Peabroke W. Bridgewater Randolph Stoughton Whitman]	Hanover Marshfield Plymouth [Bridgewater and Cape Cod]	Duxbury
Site assignment:	Yes	Yes Hingham Hull Scituate	Yes Marshfield Scituate Plymouth Bourne	Yes-Scituate, Hull, Rockland, Weymouth. Transfer to Blackstone- Hanover Hingham- North No- Norvell Cohasset	Yes- haul only in towns with approved disposal sites	The pumping Co. also has a septage receiving facility
Disposal location:	Marshfield TP Scituate TP	Hingham Night Facility- 40Z Hull Dumping Facility- 10Z Scituate WWT- 50Z			each town listed have have town run facilities, except Hanover and Bridgewater do not so we have ceased operation in those towns	lagoons located on Keene St.
Preferred site:		No		Hingham- Nite Scituate- WWP Rockland- WWP due to location and cost		
Number of trucks:	1	1	2	4	3	3
Capacity (gallons):	2500	1500	5000 5000	2000 2500 3000 6000	2150 2150 2150	3500 2500 2500

Trips to site:	7/daily	30/month	2/daily	2500- 4-6 dly 3000- 3-4 wkly 6000- 1 dly	2-3 loads/day truck	
Refusal to dispose:	Hull TP	No	No	Hull at cap. and pH	No	
Distance travelled: (miles)						
Max:	3	20	10	18 (120 round trip to Blackstone	20	
Avg:	3	10	5		5	
Min:	3	1	3		1	
Customers on schedule:						
Residential:		300 1-2 yearly	100	3-4000	60 yearly	350± annually
Commercial:	5/month		50 including condos	100	2 monthly	25 (3-4/yr)
Industrial:				50		0
Use of grease: customers:	Yes	No	Yes	Yes 75	Yes 1	
Service cesspools: Percentage:	Yes 33	Yes 40	Yes 2	Yes 30	Yes 65	
Night pumping:	No	No	No		No	
Emergency calls: (per week)	None due to dumping hours	4	2-3	1-5		
Total volume per year: (gallons)	22,000	450,000	2,600,000	4,000,000	confidential	5,000,000
Fall:		100,000	900,000		25%	1/6
Spring:		200,000	900,000		40%	1/3
Summer:		100,000	500,000		25%	1/3
Winter:		50,000	300,000		10%	1/6
Fees:	Cohasset- \$100 Scituate- \$25 Norwell- \$100 Marshfield- \$28	Hingham- \$2000 Scituate- \$2500 Hull- minimal	Ridgers- \$70\1 1000 gallons Blackstone- \$35\1000 gal.		varies from town to town Bourne \$7.50/1000 Yarmouth \$75/1000	
Problems:	Availability	Towns without facilities can rely on other towns to handle their septage	towns without disposal, costs		disposal is the single biggest problem in the industry by far	in the process of acquiring town approval for a treatment facility upgrade
Need new sites:	Cohasset Norwell	Either create new facilities or open up existing facilities to outside communities	Yes S.S. regional facility		Yes, on the South Shore in the towns without public facilities- Duxbury, Norwell Hanover, Pembroke Plympton, Carver	

DEGE SEPTAGE HAULER QUESTIONNAIRE

Questions	1	2	3	6	9	13	15
Towns Served:	Hanover Hull Hingham Marshfield Norwell Rockland Weymouth [Abington Braintree Brockton Foxboro Halifax Hanson Holbrook Milton Peabroke Plymouth Quincy Whitean]	Duxbury Hanover Marshfield Norwell Rockland Scituate [Abington Bridgewater Brockton Carver Easton Halifax Hanson Kingston Middleboro Peabroke Plympton Whitean]	Hanover Marshfield Norwell [Bridgewater Halifax Hanson Peabroke Plympton]	Duxbury [Carver Halifax Kingston Peabroke Plymouth]	All South Towns	Cohasset Duxbury Hanover Hingham Hull Marshfield Norwell Scituate Weymouth [Abington Braintree Hanson Holbrook Kingston Milton Peabroke Quincy Randolph Whitean]	South Shore Towns
Does the municipality where you operate have an assigned transfer and/or disposal site? If yes, list:	Yes Foxboro Hull Marshfield Plymouth Rockland Weymouth Whitean	No	No	Yes E. Bridgewater (with limited gallons/day) Kingston (closing June 30, 1988) Plymouth Wareham	Yes Rockland	No	No
Towns in which haulers have permits:	same as towns serviced		same as towns serviced	same as towns serviced	Rockland [Abington Braintree Halifax Peabroke Whitean] etc. etc.	same as towns serviced	Hanover Hingham Hull Norwell Rockland [Abington E. Bridgewater Halifax Hanson Kingston Peabroke Whitean]
Location of disposal:	Bridgewater Foxboro Hull Plymouth Rockland Weymouth	Marshfield (septic dump) Middleboro TP Ridders Wareham TP	Duxbury	Kingston (Raboth Rd) Plymouth (Long Pond Rd) Ridders	E. Bridgewater Rockland Weymouth	Braintree Hingham Hull Marshfield Scituate Weymouth	Ridders Simmons Rockland TP Hull TP Gr. Lawrence

Location of disposal:

Bridgewater Foxboro Hull Plymouth Rockland Weymouth	Marshfield (septic dump) Middleton (treatment plant) Ridders disposal Wareham (treatment plant)	Duxbury	Kingston (Raboth Rd) Plymouth Long Pond Rd Ridders off Rte 14	E. Bridgewater Rockland Weymouth	Braintree Hingham Hull Marshfield Scituate Weymouth	Ridders (E. Bridgewater) Simmons (Hanover) Rockland (treatment plant) Hull (treatment plant) Greater Lawrence san. district
--	--	---------	--	--	--	---

Preferred disposal site: & why?

Braintree and Weymouth are local Marshfield is excellent but low capacity	Ridders	None, they are all too expensive	Duxbury, South Shore Pumping	Would like to have a site on South Shore like Lawrence	Braintree, but it is closing Randolph, but they are not accepting applications	Upper Blackstone, they are open 24 hours, 7 days a week and the larger the volume the cheaper it is to dump
--	---------	--	---------------------------------	---	---	---

Number of trucks: Capacities: (gallons)

1 3,500	2 5,000 3,000	1 3,000	2 2,500 5,000	4 5,000 2,500 2,000	3 1,000 3,200 4,000	3 2,500 2,500 7,500
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Is vehicle at capacity at time of disposal:

Yes	Yes	Yes	Not always	Full 80% No 20%	No	No
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Average capacity hauled: (gallons)

2-4,000						2,000
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Trips to disposal site:

30/month						4-5 daily
----------	--	--	--	--	--	-----------

Refusal at disposal site and why?

Yes, Randolph and Hingham at capacity	Ridders and Brockton	No	Brockton Duxbury and Marshfield's new site- all at capacity	Rockland pH or at capacity	No	Yes, Rockland Ridders and E. Bridgewater pH
---	-------------------------	----	---	----------------------------------	----	--

Distance travelled (miles)

Average:
Minimum:
Maximum:

15	10	10	8	5	varies	10
25	2	5	3	2-3	2-3	5
	15	25	12	15	15	20

Maximum reasonable distance (miles):

10	15	5-10	10	10	20	40
----	----	------	----	----	----	----

customers on a regular pumping schedule:

300		25-30	many		6 businesses many homes	6
-----	--	-------	------	--	----------------------------	---

Frequency:	6-12\month	1-2\month	businesses weekly homes yearly	3\month
# Emergency calls\week:	10	2	20-30\week	1 or 2
Emergency disposal available:	No	No	No	No
Significant seasonal fluctuations:	Yes	Yes	Yes	Yes
Peak:	March-December	April-October November-March	spring and fall summer and winter	April, May June winter
Slow:				
Average yearly volume of septage pumped:	200,000	150,000	5,000,000	12,000,000
(gallons)				
Fall:	50,000	30,000	1,500,000	3,000,000
Winter:	25,000	20,000	1,000,000	2,000,000
Spring:	50,000	40,000	1,500,000	4,000,000
Summer:		60,000	1,000,000	3,000,000
Pumping fees:	?	None	\$10-50\gal	\$70\1000 gal
Is it fair, why:			\$10-15 is a fair price	
Disposal problems:	high costs distance to great	only 1 truck have to make many trips to dispose	not enough dump sites can not compete if hauling long distances	lack of facilities customer education of disposal costs
Problems with regulations State:	too hard on pumpers/ pH	high costs need a place to dispose of grease, WWT on the South Shore and would like more land application	cost have risen by 200% in the past 5 years need a WWT since Braintree has closed	there are regulations that require restaurant grease traps to be pumped but no facility accepts grease

Average # of tanks serviced per week:

Are holding tanks serviced:
Volume per holding tank
of holding tanks serviced:

Are grease traps serviced:
Average volume per trap (gallons):

of traps serviced per week:

Do you service industrial systems:

Willing to attend meetings to discuss problems:

3-5

Yes
1000
3-5/y

Yes

2-2,500
2-3/week

星

2-3

yes

Yes
1000

5-6/month

2

10

2,500-
5,000
10/week

2

9

Yes
2,500
240/year

yes

2,500
2/week

2/week

NO

TOWN OF CHATHAM

BOARD OF HEALTH

REAL ESTATE TRANSFER REGULATION

Purpose

To determine and protect the public health from potential and present sources of pollution to ground water or salt water from existing sewage disposal systems, the Board of Health requires that the Owner(s) of a developed property in Chatham, Massachusetts order an open inspection of the existing septic system(s) prior to the time of transfer of the property.

Table of Contents:

Section	
1	Definitions
2	General Requirements, Exceptions and Standards
3	Inspection Procedures
4	Reports, Findings, and Remedies
5	Severability
6	Enforcement

Section I DEFINITIONS

- 1.1 Developed property A parcel of land with a man-made structure erected upon it which has affixed to it an in-ground sewage system(s).
- 1.2 Open Inspection All components of the septic system(s) attached to the existing structure(s) will be uncovered and a visual inspection conducted.
- 1.3 Transfer of Property An act by which the title of a property is conveyed from one person to another.
- 1.4 Marginal System A marginal system is defined as having one or several of the following problems: the system could not be judged because of an extended period of non-use; there are problems with the individual components of the system or with the system location; records show excessive pumping (more than two (2) times within any 90-day period for Residential or Commercial property, except for required grease trap maintenance for commercial property); presence of visible Ferric Sulfide stains; the system is inadequate for intended use; system is located within 100' of a domestic water supply well, wetland or watercourse; or any other problem as defined by the Board of Health or its Agent.
- 1.5 Failed System A failed system is defined as one in which there is evidence of sewage

flow to the surface; evidence of overload of the system; the system is in such a state of disrepair that it cannot function as originally intended; lack of a four (4) foot protective zone between the bottom of the system and ground water; or any other problem as defined by the Board of Health or its Agent.

Section II - GENERAL REQUIREMENTS, EXCEPTIONS, AND STANDARDS

- 2.1 The open inspection of existing commercial and residential sewage disposal systems shall be the responsibility of the Owner of the property prior to Real Estate Transfer.
- 2.2 Property connected to the Town of Chatham sewage system is exempt from this regulation.
- 2.3 Property served by a sewage treatment plant located on the property to be served is exempt from this regulation.
- 2.4 This regulation shall not be effective at the conveyance or devise of the property to the Surviving Spouse or, in the case of joint ownership, the property is conveyed to one of the original owners. (See Sec. 3.4 ,3.5 and 3.6).
- 2.5 For the purposes of this regulation, reference is made to the standards and provisions of Title V of the State Sanitary Code, and to the existing regulations of the Chatham Board of Health Regulations for the Sub-surface Disposal of Sanitary Sewage.

Section III - INSPECTION PROCEDURES

- 3.1 All inspections must be done by a Registered Professional Engineer or Sanitarian. The Engineer or Sanitarian upon completing the inspection shall file a completed Certificate of Compliance and Inspection Form with the Board of Health with copies to the Seller, Buyer and Assessor's Office of the Town of Chatham stating whether the system(s) is in GOOD, MARGINAL or FAILED condition.
- 3.2 The Certificate of Compliance and Inspection Form is considered to be a part of this Regulation and is incorporated by reference.
- 3.3 The Inspection shall take place no more than one hundred and eighty (180) days nor less than thirty (30) days prior to the transfer of property. The Board of Health must receive the Certificate of Compliance and Inspection Form within seven (7) days of the inspection. Copies must also be forwarded to the Owner, Buyer and Assessor's Office at that time.
- 3.4 Any new Title V system having been installed and having received final inspection approval by the Board of Health or its Agent within the prior five (5) years shall be exempt from this Regulation, providing additional living space has not been added and/or there has been no change in intended use. A copy of the Disposal Works Permit and/or other evidence, approved by the Board of Health or its' Agent, must

be submitted in lieu of the Certificate of Compliance and Inspection thirty (30) days prior to each Real Estate Transfer.

- 3.5 Real Estate transfers otherwise subject to this Regulation which take place within two (2) years of an inspection under this regulation and found to be in good working order, may be exempt from this regulation upon review and approval by the Board of Health or its Agent. A copy of the original Certificate of Compliance and Inspection form must be submitted to the Board of Health or its' Agent for review thirty (30) days prior to Real Estate Transfer. Systems that were found to be in a failed or marginal condition are required to be reinspected prior to Real Estate Transfer.
- 3.6 Sellers and Buyers who transfer an existing structure with the intent to demolish and replace the existing septic system with a Title V system may apply to the Board of Health or its' Agent for exemption from this regulation. The Seller and the Buyer must apply together in writing showing that both parties have agreed to the arrangement and accept joint responsibility for seeing that the new system is installed. An engineer hired by the party(s) must provide in writing that he/she has been contracted to do the plan and that a preliminary survey of the lot in question shows that a septic system in compliance with Title V and Town of Chatham Regulations can be installed on the lot. A proposed time frame for demolition and installation must be submitted at the time of application.
- 3.7 Establishing groundwater levels: Unless exempted from this requirement by the Board of Health or its Agent, septic systems or components of systems that are located below elevation 15' (using U.S.G.S. Mean Sea Level datum) or within 100 feet of a wetland are required to have a test boring or deep observation hole dug in order to establish the groundwater level. When depth to groundwater has been measured it should be adjusted to reflect the adjusted depth using the procedures outlined in Estimating Highest Groundwater Levels for Construction and Land Use Planning- A Cape Cod, Massachusetts Example, Michael H. Frimpter and Martha N. Fisher. USGS Water Resources Investigations 83-412.

Section IV - REPORTS, FINDINGS, AND REMEDIES

- 4.1 If the Inspection finds the system to be in FAILED condition, the Board of Health shall determine after receiving the Certificate of Compliance and Inspection Form, whether or not the system constitutes a danger to the Public Health and should be repaired or replaced. The Board of Health, or its Agent, must notify the Owner by Certified Mail whether or not the system must be repaired or replaced.
- 4.2 If the Board of Health or its Agent determines that the system constitutes a danger to the Public Health, the Board shall order the Owner to make repairs and/or replace the system according to the regulations as set forth in Title V of the State Sanitary Code and the Town of Chatham Minimum Requirements for the Disposal of Sanitary Sewage. If the work is not completed within the time designated by the

Board of Health, the Board may impose fines and/or repair or replace the system at the expense of the Owner.

- 4.3 If the Inspection finds evidence of sewage on the surface or draining into any waterways or wetlands, the Board of Health or its Agent is to be notified by the Engineer or Sanitarian within 24 hours.
- 4.4 If the Inspection finds the system to be in MARGINAL condition, the Board of Health will decide, after receiving the Certificate of Compliance and Inspection, whether or not the system constitutes a danger to the Public Health and should be repaired or replaced. The Board of Health, or its Agent, shall notify the Owner by Certified Mail whether or not the system must be repaired or replaced.
- 4.5 The amount of allowable time for the repair or replacement will be determined by the Board of Health or its Agent and will be contained in the letter of notification to the Owner. A copy of the Notification will be filed at the Town Assessor's Office.
- 4.6 If repair/replacement is required, upon completion of that work, the Health Agent must inspect and signify, in written form, that satisfactory repairs have been made.

Section V SEVERABILITY

- 5.1 Each part of this regulation shall be construed as separate to the end that if any paragraph, sentence, clause or phrase thereof shall be held invalid for any reason, the remainder of that regulation and all other regulations shall continue in full force.

Section VI ENFORCEMENT

- 6.1 The Board of Health or its' duly appointed Health Agent are authorized to issue Notices of Violations, Cease and Desist Orders, and other enforcement orders to compel compliance with the terms of this Regulation, as it or they deem necessary and appropriate.
- 6.2 In addition to any other remedy, the Board of Health and/or its' Agents may take any enforcement action deemed appropriate including but not limited to Criminal Prosecution, including fine as set forth in MGLA Chapter 111, Sec. 31, or Civil Action in the Courts of the Commonwealth for injunctive relief and/or money damages, or both Criminal and Civil enforcement.

SEPTIC SYSTEM INSPECTION REPORT

Present Owner _____ Date _____
 Mailing Address _____
 Location of Property _____
 Name of Engineer/Sanitarian _____ License Number _____
 Mailing Address _____

ALL SYSTEMS SHALL BE UNCOVERED FOR INSPECTION AND A TAPE SURVEY
 SKETCH WILL BE INCLUDED IN THE INSPECTION REPORT.

I Description of Property

RESIDENTIAL

1. Lot size _____
2. No. of Bedrooms _____
3. Total No. of Rooms _____
4. No. of Appliances: Dishwasher _____
 Garbage Disposal _____ Washing Machine _____
 Jacuzzi _____ Other (Explain) _____
5. Length of Present Ownership _____
6. Year-round Residence? _____
 If Seasonal, No. Weeks Use per Season _____

COMMERCIAL

1. Lot Size _____
2. Type of Business or Intended Use _____
3. Number of Employees _____
4. Number of Toilets _____
5. Rooms with bath _____
6. Other Grey Water Discharge _____
 explain _____
7. Annual Water Usage (if Metered) _____

COMMERCIAL AND RESIDENTIAL

8. Town water _____ Private well _____ If well, distance from septic system _____ ft. (If less than 100', show location and distance on tape sketch map.)
9. Last 2-year pumping record (from Chatham Board of Water and Sewer Commissioners files)
 Record: Date pumped _____ Type service _____ by _____
 Date pumped _____ Type service _____ by _____

II Description of Sanitary System

1. Date installed _____
2. Cesspool _____ Septic tank _____ Other _____: describe _____
3. Septic tank size _____ gals. Number of leaching pits _____
4. If system cannot be found after a reasonable search, explain evidence for system's success or failure:

III Result of Open Visual Inspection of Septic System

1. Standing water level (in tank or cesspool) _____ Leaching pit _____
2. Algal growth: Yes _____ No _____ Describe: _____
3. Lush growth around leaching area: Yes _____ No _____ Describe: _____
4. Odor: Yes _____ No _____ Describe: _____
5. Waste water discharge slow? Yes _____ No _____ Describe: _____
6. If cesspool, are all blocks in place? Yes _____ No _____ Describe condition: _____
7. Distance from bottom of leaching facility to ground water (where applicable): _____

IV Tests performed:

1. Borings: Yes _____ No _____ Describe: _____
2. Observation holes: Yes _____ No _____ Describe: _____
3. Flushings: Yes _____ No _____ Describe: _____
4. Other tests: Type _____ Describe: _____

V Comments:

CERTIFICATE OF COMPLIANCE

Certificate Number _____

Property Location _____

Seller's Name _____

Address _____

Forwarding Address _____

Buyer's Name (if known) _____ Current Address _____

THIS IS TO CERTIFY THAT I HAVE INSPECTED THE SEWAGE DISPOSAL SYSTEM LOCATED ON THE ABOVE PROPERTY AND, AS OF _____ (date), FIND IT TO BE IN:

I _____ **GOOD WORKING CONDITION.** From the visual and on-site inspection, pumping records and other required on-site work, this system appears to be in good working order. Comments: _____

II _____ **MARGINAL CONDITION.** A review by the Board of Health or its Agent is recommended because:

_____ System could not be judged because of an extended period of non-use. Approximate number of months: _____

_____ Problems with individual components of the system or its location. Explain: _____

_____ System is located within 100 feet of a wetland or watercourse. (Indicate location and distance on map)

_____ System is located within 100 feet of a domestic water supply well. (Indicate location and distance on map)

_____ Records show excessive pumping (more than two (2) times within any 90-day period for Residential Property or Commercial Property (except for grease trap maintenance for Commercial Property).

_____ Ferrous sulfide stains noted.

_____ System inadequate for intended use. Explain: _____

_____ Other: _____

III _____ **FAILED.** The first three conditions listed below require Board of Health notification within 24 hours.

_____ Evidence of sewage flow to surface.

_____ Evidence of breakout or other overload of the system.

_____ System is in such disrepair that it cannot function as originally intended.

_____ Lack of a 4 (four) foot protective zone between the bottom of the system and groundwater.

Description of evidence of failure:

Signed: _____

Title: _____

Date: _____

Copies: Chatham Board of Health
Chatham Assessor's Office
Property Owner
Property Buyer

Septage haulers raise prices as lagoon dumps shut down

By Peyton Fleming
The Patriot Ledger 3/4/89

With septage lagoons being shut down in Massachusetts and sewage treatment plants turning them away, septage haulers are running out of options for getting rid of the acrid black residue that is pumped from septic tanks.

The dearth of disposal choices has haulers raising their rates and communities scrambling to develop new disposal methods.

"There have been several of us that have had to really curtail operations, lay off people and incur higher costs to the consumer," said Michael Spirito, who runs a septage hauling business in Hingham.

Spirito's rates have almost doubled since 1985, to \$140 to pump out the typical residential 1,000-gallon septic tank.

Triggering the septage disposal problem is the state's recent crack-down on septage lagoons. Fearful that the open septage pits will contaminate groundwater, the state Department of Environmental Quality Engineering has ordered most of the remaining lagoons to close — including those in Foxboro, Marshfield, Duxbury and Hanover.

"All of them could cause groundwater contamination because they weren't properly lined," Ron White, a DEQE environmental engineer, said.

Many of the lagoons will stay open until communities find other ways to get rid of the waste. In Marshfield, for example, town-operated lagoons



Fred Field/The Patriot Ledger

Karl Nordin stands before one of four Marshfield septic waste lagoons the state wants closed. Nordin is in charge of operating the lagoons.

will stay in business until December 1990, when the town expects to finish upgrading its sewage treatment plant to handle septage waste.

In Hanover, use of a lagoon operated by the Earl F. Simmons Co. has been dramatically curtailed. "The daily amount (we can receive) has been cut way back," said company Vice President Steve Simmons.

Tighter restrictions at sewage treatment plants have added to the disposal problem. Last year Hull's treatment plant reduced the amount

of septage it would accept to 10,000 gallons a day, from 40,000 gallons a few years ago. The plant also is no longer accepting out-of-town septage.

For Spirito, who had relied on the Hull plant to service customers in Cohasset, Hingham and Norwell, the cutback was a disaster. "Hull pulled the rug out ... from beneath the pumpers," said Spirito, whose pumping business is down 50 percent.

Spirito now uses a lagoon in East Bridgewater but is limited to 6,000 gallons a day.

Appendix E

South Shore Septage Management Study Treatment Plant Survey

What is the design capacity? Average Daily Flow _____ (mgd)
What is the current flow? Average Daily Flow _____ (mgd)

What type of treatment is provided? (primary, secondary, advanced etc.) _____

Which communities does your facility serve? _____

What is your design load for BOD? _____ lbs/day
What is your design load for TSS? _____ lbs/day
What is your present loading for BOD? _____ lbs/day
What is your present loading for TSS? _____ lbs/day

How much septage is received on a daily basis? _____ gallons

What percentage of the septage is from within the municipality\district? _____ %

Do you treat septage from outside your municipality\district? Yes _____ No _____

If yes, please list the communities and approximate percentage from each.

<u>Community</u>	<u>Percentage</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

What is the maximum daily amount of septage that can be treated without harm to the plant's operation? _____ gal/day

What are the operating hours of the plant for septage disposal? _____

Does septage volume fluctuate by season? Yes _____ No _____
If so, please specify peak season(s) and estimate increase in volume.

At what point do you allow septage to enter the system (i.e. manhole in collection system, headworks receiving facility, etc.)? _____

Is access restricted or controlled? Yes _____ No _____
If yes, how? _____

Are any pretreatment facilities provided for septage? Yes _____ No _____
If yes, please describe: _____

Are there any arrangements for emergency dumping (holidays, weekends, nights, etc.) Please specify: _____

Do you accept any industrial septage? Yes _____ No _____
If yes, how much? _____

Do you receive any commercial septage? Yes _____ No _____
If yes, how much? _____

Do you receive any grease waste? Yes _____ No _____
If yes, how much? _____

Please list the commercial businesses, industries and private septage haulers that use facilities?

Name

Address

What is your method of controlling haulers (permits, prepaid fees, sampling, making sure they are Title V licensed....etc.)? _____

What are your charges for accepting septage?

In-town rate: _____

Out-of-town rate: _____

Basis for rate (i.e. BOD, TSS, electrical costs, etc.): _____

Have you ever had to refuse septage loads? Yes _____ No _____
If yes, Why? _____

Have you ever had operational problems in the past as a result of

a. septage disposal? Yes _____ No _____

b. commercial waste? Yes _____ No _____

c. industrail waste? Yes _____ No _____

If yes, please describe the problem(s): _____

Do you forward copies of hauler record sheets to local Boards of Health for their review? Yes _____ No _____

If yes, which communities? _____

Under what conditions do you accept septage (i.e. written contracts with the towns, with the haulers, verbal agreements...etc.)? Please explain: _____

Would you consider accepting septage from outside your municipality\district in emergency conditions? Yes _____ No _____

If yes, what are the administrative procedures necessary to allow for proper disposal? _____

If no,
Have you ever accepted septage in the past from other communities? _____
Why or why not? _____

Please specify the reasons you do not currently accept septage? _____

What type of changes would have to take place at the plant before you would be able to accept septage? _____

What incentive would be necessary for you to accept septage (i.e. capital cost for equipment, reciprocal agreement for sludge disposal, etc.)? _____

From within your municipality: _____

outside your municipality: _____

Facility _____

Operator _____

Appendix E

DEGE TREATMENT PLANT QUESTIONNAIRE

Facility:	Cohasset WWT	Marshfield WWT	North River WPC Plant	Rockland WWT
Location:	43 Elm Street Cohasset	200 Town Pier Road Brant Rock	161 Driftway Road Scituate	Concord Street Rockland
Operator:	Stephen Cushing	Karl S. Mordin		Aram Varjabedian
Towns served:	part of Cohasset	part of Duxbury Marshfield	Scituate	Abington Rockland
Type of treatment provided:	secondary	secondary	secondary	advanced
Design capacity: (mgd)	.072	2.1	1	2.5
Current flow:	.088	1.0	.9055	1.8
Maximum flow:	.150	6.0	2.5	6
Abandoned facilities:	No	Yes, clarifiers		No
BOD (lbs/day)				
Present loading:	164	850	1,667	2,600
Design load:	120	920	2,000	4,696
TSS (lbs/day)				
Present loading:	127	908	1,576	2,800
Design load:		1,150	2,000	5,538
Does the plant accept septage:	No	No, planning septage facility open- fall 1990	Yes	Yes
Volume of septage daily (gal):			11,000	1,850
% of septage from community:			100	100
% of septage from outside:		do not intend to accept septage from outside communities	None	None
Maximum daily volume (gal) of septage plant can take with- out harming operation:			7,000	4,000
Volume fluctuation by season:			No	May & June 15,000 gal
Odor control measures:			carbon absorbers 556	chlorination NaCO3
Pretreatment facilities for septage:			grit removal	continuous aeration chlorination if necessary, inlet to tank has bar rack
Accept industrial waste by hauler:			No	No
Accept grease by hauler:		No	No	
Accept commercial waste:				Yes, very little
Accept landfill leachate by hauler:		No	No	No

All Town Inc.	AAA Atlas
C. Spirito	A Able
P.F. Spencer	C. Spirito
Rooterman	Dana Mash & Sons
R.Rodrigues & Sons	
Rosano	
Mash	
Anderson	
Marshfield Sanitary	
Pumping	

Towns served by haulers:

Scituate	Rockland
----------	----------

Method of control of Haulers:

prepaid dump ticket
(1000 gallon)

Septage disposal fees:

\$0.01 per gallon	\$12/1000 gallons
-------------------	-------------------

Basis for rate:

BOD loading	Sever Board
-------------	-------------

Refused septage loads:

No	Yes pH, visual odor unusual
----	-----------------------------------

Why:

Operational problems:

No	Yes due to organic loading, nutrients and fluctuations summer operation requires advanced treatment with phosphorous removal trouble meeting discharge permit, plant not designed for heavy septage disposal
----	--

Forward hauler records to B of H:

No	No, slips filed on-site
----	-------------------------

Point of entrance of septage
into system:

headworks of facility	Aerated holding tank, pumped with influent to aerated grit chamber
--------------------------	---

Is septage access restricted
or controlled?

drivers must stop at office and leave a disposal ticket	holding tank, - pump rate set at designated rate of to meet influent flow
---	---

Emergency arrangements:

No	emergency basis per order of Sever Commission only
----	--

Accept septage under what
conditions:

licensed by town
dump ticket, amount
and homeowner

information

Would consider accepting septage outside municipality:		No	No
In the past accepted septage From other communities:		No	on one occasion in an emergency
Willing to accept in future:		No	No, opposed by Sever Commission there are strict summer effluent compliance anaerobic sludge digesters
Reason for not accepting now: for	not designed to accept septage system over capacity	Inoperable grit removal, odor burden	local ordinance plant not designed unlimited disposal
What changes are needed to accept septage:			town approval to increase capacity need to consult Sever Commission
What incentive is needed to accept septage:		undecided at present, not intending to accept septage from outside communities	ask Board of Selectmen determined by Sever Commission

MAPC TREATMENT PLANT QUESTIONNAIRE

Facility:	Mull WWTP	U. Blackstone	Ridders Farm
Location:	111 Mantasket Ave	Route 20	PO Box 310
Operator:	Mull Norman A. Rogers	Millbury Arthur Levesque	Whitman John and Richard Ridder
Towns served:	Mull	Cohasset Hanover (within study area) over 30 towns outside S.S.	E. Bridgewater Whitman Hanson and local towns
Type of treatment provided:	secondary	primary and secondary Nov-May Advanced June-Oct	lagoons
Design capacity: (mgd)	3.07	56	24,000 gallons
Current flow:	1.05	34	18,000 gallons
Maximum flow:			
BOD (lbs/day)			
Present loading:	1150	37,000	
Design load:	5850	71,000	
TSS (lbs/day)			
Present loading:	1850	43,000	
Design load:	6120	71,000	
Does the plant accept septage:	Yes	Yes	Yes
Volume of septage daily (gallons):	2,000	2,500,000	18,000
% of septage from community:	100	gals monthly	
% of septage from outside:	None	and 500,000 gals of sludge/month (from other TP's)	
Maximum daily volume (gallons) of septage plant can treat without harming operation:	10,000	not experienced yet	24,000
Operating hours for septage acceptance:	M-F 7:30am-3:30pm	anytime	8-4 M-F 8-12 Sat
Septage volume fluctuation by season:	Yes Spring and Summer increase of 10%	Yes picks up in Spring and falls off in winter	Yes 20% in spring
Odor control measures:			
Pretreatment facilities for septage:	No	No	

Point of entrance of septage into septage systems:	manhole 50 ft. up-stream of headworks	Headworks	manhole
Is access restricted or controlled:	Yes	Yes, permit system and log in sheet, someone is always on duty and can be seen coming and going	Yes, gates are locked
Are there emergency arrangements:	a phone call ahead	anytime	No
Accept commercial septage	Yes, From Hull only and very limited	Yes,	No
Accept industrial waste by hauler:	No	No	No
Accept grease by hauler:	No	Yes, small I	
Accept landfill leachate by hauler:			
Haulers:	C. Spirito E.L. Margetts J. Papasodero		Spirito A-I Nash Eveready Avery Hurley etc
Towns served by haulers:	Hull	Cohasset Hanover	
Method for controlling haulers:	permits and sampling	Title V, permit system, log sheet	town permits
Septage disposal fees:	\$30\0-1500 gals \$50\1501-2000 gals \$75\2001-3000 gals	in-town: free out-of-town: \$29/1000 + \$6 permit fee	\$64 in-town \$70 out-of-town
Basis for rate:		average septage strength, compared to raw sewage strength treatment costs	
Refused septage loads: Why:	Yes pH not in compliance	Yes industrial source and unauthorized municipality	Yes high or low pH
Operational problems:	Yes with septage disposal, due to solids processing	Yes, with septage disposal, industrial wastes (SVI problems)	No
Accept septage under what conditions:	printed contract forms with haulers	written contracts with the towns	contract with haulers

they are in the
planning stages
of a plant upgrade

Would consider accepting septage
outside municipality:

No

Yes

Accept septage from outside
for emergency purposes:

No

Yes

Would need a
declaration of
emergency by
DEQE followed
by a contract
with the town
No new contracts
being excepted
at present

In the past accepted septage
from other communities:

Yes

Willing to accept in future:

We anticipate within 6
months, after our new
solids processing equip-
ment is in operation

Reason for not accepting now:

solids and odor problems

What changes are needed to accept
septage:

solid processing
equipment

What incentive is needed to accept
septage:

State and Federal funds
would be appreciated

Appendix F
Sample Pumping Permit

Permit Number _____

Property Owner's address _____

Town _____

Property Owner's Name _____

Septage Pumper's Name _____

Septage Pumper's Address & Phone Number _____

Date _____

Time _____

Number of Gallons Pumped _____

Signature of Septage Pumper _____

Signature of Homeowner _____
Check if no one home _____

Septage Disposal Site Location _____

Appendix G

SUGGESTED GENERAL BY-LAW FOR
MUNICIPAL INSPECTION AND MAINTENANCE OF
ON-SITE SEWAGE DISPOSAL SYSTEMS

1. For the purpose of ensuring compliance with minimum standards for the health and safety of the inhabitants of the Town of and to provide for the pumping and disposal of the contents of privies, cesspools and septic tanks as a public service, it shall be the duty of the Board of Health to examine, remove or prevent nuisances due to improper on-site sewage disposal systems, and the Board of Health is directed and authorized to implement a program of septic system inspection and maintenance, and disposal of the contents of such septic systems as an alternative to the system of common sewers and for the protection of surface and groundwater resources of the town from pollution.
2. The Board of Health shall adopt and enforce rules and regulations relative to such a program of inspection, maintenance and disposal of the contents of privies, cesspools, and septic tanks within the town, to issue necessary permits, and to establish reasonable fees to defray the costs of such program - such fees to be paid by the owners of properties included in the program.
3. The Board of Health shall have express authority under this by-law to make inspections of on-site sewage disposal systems, failure to maintain a proper system may be deemed a nuisance, and the Board of Health may require such system to be cleaned or repaired at the expense of the property owner.

SUGGESTED BOARD OF HEALTH REGULATIONS FOR
MUNICIPAL INSPECTION AND MAINTENANCE OF
ON-SITE SEWAGE DISPOSAL SYSTEMS

Section 1 - Authority

- 1.1. - These rules and regulations are adopted by the Board of Health of the Town of _____ acting under the authority of Chapter 111 of the General Laws and Section _____ of the By-Laws of the Town of _____ for the purposes of a program of inspection and maintenance of cesspools and septic tank systems and the collection and disposal of the contents of such systems.
- 1.2. - To ensure compliance with the requirements of Title Five of the State Environmental Code, every owner, agent or occupant of premises in which there are private sewage disposal systems shall keep such systems in proper operational order including means of access for inspection and pumping, and shall have such systems cleaned or repaired at such times as ordered by the Board of Health.
- Failure to comply with such orders, or to maintain such a system in a manner which will prevent objectionable conditions may be deemed a nuisance injurious to the public health.
- 2.0. - Inspection of Premises
- 2.1. - For the purpose of determining the proper operation of on-site sewage disposal systems within the Town of _____, such systems shall be subject to inspection by the Board of Health at intervals of not more than two years.
- 2.2. - The Board of Health shall maintain a record of each system inspected, including the address of the premises, name and address of the owner/occupant, description, and shall keep a record of the condition of any system or component thereof on the inspection date.
- 2.3. - The Board of Health shall report to the owner/occupant any system found to require improvement, repair, alteration or replacement and may make recommendations as to the appropriate type and size of system required.

THE HISTORY OF THE CITY OF BOSTON

1780

The first settlement of the city of Boston was made by a small party of Englishmen, who arrived in the year 1630, and founded the town of Boston. They were followed by a large number of emigrants, who came from England, and in the year 1634, the city was incorporated as a town. In the year 1688, it was again incorporated as a city, and in the year 1780, it was again incorporated as a city.

The city of Boston has since that time continued to grow, and in the year 1780, it was again incorporated as a city.

1780

The city of Boston has since that time continued to grow, and in the year 1780, it was again incorporated as a city.

1780

The city of Boston has since that time continued to grow, and in the year 1780, it was again incorporated as a city.

The city of Boston has since that time continued to grow, and in the year 1780, it was again incorporated as a city.

MODEL HEALTH REGULATION (OR BYLAW)
FOR MUNICIPAL INSPECTION AND PRIVATE MAINTENANCE
OF ON-SITE SEWAGE DISPOSAL SYSTEMS

ARTICLE I. MAINTENANCE

Section 1. Septic Tank Pumping

The septic tanks of all on-site sewage disposal systems within the boundaries of the Town (City) of _____ shall be pumped within three years of the effective date of this ordinance, and every third year thereafter. The Board of Health may require more frequent pumpings of any septic tank where he or she find such additional pumping necessary to the proper operation of the septic tank system.

Section 2. Proof of Compliance

All septic tank pumpers must be licensed in accordance with Title 5 of the State Environmental Code. Septic tank pumpers shall issue to owners of the septic tanks which they pump out a signed receipt showing the date of pumping, the name and address of the septic tank owner, and a description of the location and size of the septic tank. The owner shall sign the receipt, and the pumper shall submit a copy to the Board of Health. The receipt shall serve as proof of compliance with this Article.

ARTICLE II. INSPECTION

Section 1.

All on-site sewage disposal systems within the Town (City) of _____ shall be inspected by the Board of Health within three years of the effective date of this ordinance and every three years thereafter to determine whether all components of the system are operating properly and are not malfunctioning.

Section 2.

Any system or component thereof which is found to be malfunctioning or a nuisance to public health, safety and welfare or to the quality of surface waters or groundwaters shall be ordered remedied in accordance with Title 5 of the State Environmental Code.

Section 3.

For any system which is serving an existing dwelling or structure and which must be upgraded, altered or replaced, a site investigation to determine the appropriate type and size of system in accordance with Title 5 of the State Environmental Code shall be conducted.

Section 4.

The Board of Health shall prepare a report for each system inspected, including the name and address of the on-site sewage disposal system owner, a description of the location and type of system, and whether or not the system or any of its components is operating improperly. For any system found to be operating improperly, the report shall also include a copy of the site investigation report as described in Section 3.

Section 5.

All violations of municipal and state health regulations and the State Plumbing and Environmental Code discovered during on-site sewage disposal system inspection shall be reported, and appropriate corrective and enforcement actions shall be taken by the municipality and/or state.

MODEL HEALTH REGULATIONS (OR BYLAW)
FOR PRIVATE INSPECTION AND MAINTENANCE
OF ON-SITE SEWAGE DISPOSAL SYSTEMS

ARTICLE I INSPECTION AND MAINTENANCE OF ON-SITE SEWAGE DISPOSAL SYSTEMS

Section 1. Purpose

It is recognized that proper maintenance of septic tanks will increase the useful life of all on-site sewage disposal systems which rely on soil absorption of septic tank effluent. To further the purpose of increased life of such on-site disposal systems and to protect the health, safety and welfare of the inhabitants of the Town (City) of _____, the Town (City) of _____ hereby establishes a septic tank maintenance permit program.

Section 2. Permit Required

No owner may occupy, rent, lease, live in or reside in, either seasonally or permanently, any building, residence or other structure serviced by a private domestic sewage treatment and disposal system unless the owner has a valid septic tank maintenance permit for that system issued in his/her name by the Board of Health. Owner is defined to mean a natural person, corporation, the state or any subdivision thereof.

Section 3. Fee

A fee of \$ _____ shall accompany each application for a septic tank maintenance permit.

Section 4. Permit Application

Application for a septic tank maintenance permit shall be made to the Building Commissioner on forms supplied at the Town Clerk's office. All applications shall state the owner's name and address, the address or location of the private sewer system and shall contain the following statement:

"I certify that on _____ day of _____, 19____, I inspected the septic tank located at the address stated on this application, and I (check one):

_____ pumped all sludge and scum out of the septic tank, or
_____ found that the volume of sludge and scum was less than 1/3 of the tank volume, and I did not pump the septic tank.

Signature

Sanitary License Number

Section 5. Issuance

The Board of Health shall issue a permit to the applicant upon receipt of the fee and a completed application, properly signed by a person licensed to service septic tanks and stating his sanitary license number. The permit shall include on its face all information contained in the application and shall contain the date of issuance.

Section 6. Validity

The permit issued under this section shall be valid for a period of two years from the date of issuance.

Section 7. Sale of Property

When property containing a private domestic sewer system is sold, the new property owner, prior to occupying, renting, leasing or residing in the building, residence or structure served by the system, shall make application for and receive a septic tank maintenance permit. However, the system may be used for a period not to exceed 30 days after making application for a permit.

Appendix K

SUMMARY OF PREVIOUS SEPTAGE STUDIES FOR SOUTH SHORE COMMUNITIES

Town of Norwell, Massachusetts, Facility Plan for Wastewater and Septage Management, May 1984. Linenthal Eisenberg Anderson, Inc. Engineers

Summary: The Town of Norwell commissioned a 201 Wastewater and Septage Management Facilities Plan to LEA Inc. in May of 1984. An assessment of existing wastewater management in Norwell is included. Also, there is a comprehensive environmental inventory of the areas' water quality, climate, topography, drainage, geology, and groundwater, and other environmental and social characteristics are examined. Land-use, population characteristics, and wastewater flows are investigated to develop a community wastewater management plan for Norwell. This data is then used to assess the impacts of wastewater management alternatives upon various factors. Alternatives are screened considering all above factors to determine the most cost-effective, complete, wastewater management plan.

Conclusions and Recommendations of the 201 Facility Plan:

It was determined that the continued use of on-site septic systems will provide adequate protection of ground and surface water and public health. Some sections of Norwell (Brantwood Manor and Norwell Homes) may need to have on-site systems replaced with communal systems providing secondary treatment.

The Junior High School leaching area needs to be evaluated more. If an in-town septage disposal facility is not constructed then an on-site treatment system must be evaluated for the Junior High School, Nellie Sparrell School, Highway Garage, and the Osborne School (Town offices).

If a long term intermunicipal disposal agreement cannot be arranged with Hull or Brockton then an in-town septage treatment facility consisting of lime stabilization, followed by filter press dewatering and landfilling is the most cost-effective and environmentally acceptable plan for sewage treatment and disposal.

The most viable (cost-effective and environmentally sound) site for the treatment facility is at the Highway Garage.

The Osborne School site is considered to be the most appropriate for the disposal of dewatered septage and secondary treated effluent.

Continuous inspection of on-site systems should be established. In addition, a water conservation program should be implemented.

Recommendations:

Submit Facilities Plan to the DEQE for review. Appropriate funds and authorize submittal for step 2 of the EPA Grant application. However, the town concluded that operation and maintenance costs are prohibitive with a small facility serving one community. Regionalization is the optimum situation.

Design rehabilitation for on-site system failures. Possibly provide qualified staff or Health Agent to regulate system design, installation and maintenance of on-site systems. Adopt on-site system By-laws acceptable to the State and EPA.

Continue negotiations with Hull and Brockton for a long term (20 years) agreement for handling septage from Norwell. However, in following up on this recommendation, the town found that both disposal facilities were not willing to talk about anything long term. Ridders Farm in East Bridgewater was also approached concerning a long term agreement. Ridders made the option cost prohibitive. Consequently, the town of Norwell has to rely on private haulers to suit the needs of septage disposal.

Town of Hingham Septage Management Feasibility Study, Lombardo & Associates, Inc. May 19, 1986

Introduction

Lombardo and Associates was asked by the Hingham Sewer Commission to conduct a preliminary feasibility study of alternative septage management methods. The alternatives focus on serving Hingham alone. The ultimate septage disposal option depends on a combination of factors: legal questions over expanding the MWRA system, potential disposal at other nearby facilities (Hull) or proposed in-town facilities, institutional issues of a regional facility, comparative costs, economies of scale of possible methods, siting availability and impacts, input from residents, and the need for short term and long term solutions.

CONCLUSIONS AND RECOMMENDATIONS

Technical Viability. In-town solutions focus on two methods: treatment at an expanded MWRA system or a new facility. Out-of-town solutions include a full contract with Hull WWTP. Composting can be considered as well as other alternatives such as regional facilities.

Sites. Several potential sites were found in the northern, central and southern parts of town. The site viability varies with method selected.

Twenty-seven sites are investigated, eight are considered to be potentially suitable for septage facilities. The factors considered were: 20 acre minimum, SCS soil limitations, roadway access, limited number of property owners, and sufficient distance from residential areas.

Associated Costs with Facilities:

1. Capital Cost. Because Hingham as a whole generates very little septage, a larger regional facility presents better economies of scale when considering the capital investment. Although institutional issues are many, due to high capital costs the study recommends that a regional facility be pursued. The primary question to be answered is whether Hingham should be the lead town to provide services to the other towns.
2. Annual Operation Maintenance Cost. Again, for a Hingham only plant there is a dis-economy of scale. High costs could be slightly reduced with several management options. These options include automated access to the septage receiving facility (magnetic card system), part-time operations and staffing to coincide with peak periods, and contract pumping of the entire Town of Hingham (one pumper who also operates the facility or the town could assume this responsibility). However, the costs would be optimized with a regional option.
3. Sludge Disposal. Sludge disposal can represent up to 50% of facility costs. Disposal options include: landfilling (town landfill), land application (golf course), and contract where sludge is removed by private vendor for disposal outside of town.

Contract disposal will be the alternative implemented consistent with the assumptions in this study.

Environmental Impacts

A major concern is groundwater and drinking water supplies. Detailed hydrologic and soil studies may be required to confirm site suitability. Other concerns include odors, aesthetic effects, traffic generation and compatible abutters.

Implementation

The feasibility of the various techniques depends on institutional factors. For example, the availability of nearby facilities (MWRA) for disposal rests on legal issues. Also, a regional solution depends on joint need and cooperation among neighboring towns.

Regionalization

Although not the focus of this study regionalization merits further efforts. Several advantages bear careful consideration. 1) cost effectiveness, 2) a regional facility would not require proportionally greater acreage, and 3) regionalization may afford the added advantage of state or federal funds.

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